

Dental

Abstracts

a selection of world dental literature

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Dental

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Abstracts

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AMERICAN DENTAL ASSOCIATION

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**Dental
Abstracts
has
these
purposes**

1. *To present a selection of pertinent literature representative of all points of view within the profession;*
 2. *To provide, by a few hours' reading each month, a survey of the significant advances being made by dentistry throughout the world, as reflected in current dental literature; and*
 3. *To supply enough data in each abstract so that the reader may determine whether he wishes to refer to the original article for more complete information.*
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The abstracts are grouped in broad classifications. The specialist will learn from this periodical of work done in other fields as well as in his own. The general practitioner will be able to keep abreast of modern knowledge in the various specialties. Articles from which abstracts have been made are on file in the Library of the American Dental Association and may be borrowed by members of the Association. Requests for articles should be addressed to the Bureau of Library and Indexing Service, American Dental Association, 222 East Superior Street, Chicago 11, Illinois. Only three articles may be borrowed at one time, and they may not be kept longer than one week. No charge is made to Association members for this service.

Periodontics and endodontics



Periodontics

Balneotherapy at Karlovy Vary in periodontal disease

(Balneotherapie parodontopatii v
Karlovyh Varech)

Čestmir Parma. *Českoslov.stomat.* 55:206-219
April-May 1956

Although it is questionable whether irrigation of the gingiva alone can obtain cures in periodontal disease, balneotherapy as it is used at the Czechoslovakian spa, Karlovy Vary (Carlsbad), can be an important addition to the customary treatment of the various types of periodontal disease.

The treatment of periodontal disease by oral irrigations, massages and baths is based on the chemical properties of the springs of Karlovy Vary. In 12 treatment rooms at the Institute for

Periodontal Diseases, more than 300 patients are treated daily. The Institute's staff consists of two periodontists, two dental practitioners, one physician, two dental assistants and two dental nurses.

Before the first treatment, the teeth of the patients are examined, the oral conditions recorded, calculus deposits eliminated, the articulation equalized by grinding and the gingiva sclerosed.

The treatment consists mainly of irrigation and massage of the gingiva with the chemically potent mineral water of the Karlovy Vary "Sprudel" spring. This mineral water is applied with specially constructed oral irrigators for from 15 to 20 minutes daily.

The curative effects of balneotherapy result from specific and unspecific factors. The specific factors active in the mineral waters of Karlovy Vary are the anions SO_4^{--} and HCO_3^- , and the cations Ca^{++} and Mg^{++} . The unspecific factors are as follows: (1) the amount of mineral water used in each irrigation (from 40 to 50 liters); (2) the length of time of irrigation (from 10 to 30 minutes); (3) the varying water temperature (from 37° to 47° C.) and (4) the changeable water pressure.

The primary clinical effect of the "Sprudel" water on the mucous membrane is that of an astringent.

Figure 1 Treatment room at the
Institute for Periodontal Diseases
in Karlovy Vary



Figure 2 Instruments used for gingival irrigation and massage. Above: The perforated "spoon" and the perforated "horseshoe." Below: The elongated tube

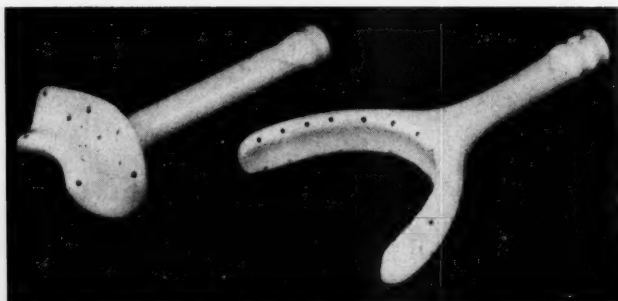


Figure 3 Instruments in operation. Left: The "spoon." Right: The "horseshoe"

In the treatment of the inflammatory types of periodontal disease, only the unspecific factors are applied such as cleaning the teeth thoroughly with brushes and toothpaste before irrigation, keeping the water temperature at a comparatively high level (from 37° to 42° C.), and gingival massage by extreme water pressure for 15 minutes daily during 10 continuous days.

Specific factors are used in instances in which an increased blood supply to the periodontal tissue is desired and in those in which atrophy or dystrophy of the bones is present. During this treatment, the patients are under strict control. Periodically, roentgenograms are taken to foresee possible complications.

When a soft and decalcified dentin layer is present below crowns and fillings prior to treatment, this layer sometimes is dissolved and

crowns or fillings fall out. These complications, although rare, are highly unfavorable, and the patients should be informed before treatment that such possibilities exist.

The positive effects of treatment consist in a thorough cleansing and decreasing in depth of the periodontal pockets, and in a permanent and adequate flow of blood to the gingival tissue. Hemorrhage in the gingival region decreases and some loose teeth become firmly imbedded. Such an improvement, however, cannot last unless the local irritants have been eliminated.

Some types of periodontal diseases such as endogenous periodontitis when accompanied by diabetes mellitus, cholecystitis or gastrointestinal disturbances and chronic proliferating periodontitis are resistant to treatment. In these instances, treatment utilizing the specific factors is added

to the one that uses the unspecific factors.

In balneotherapy at Karlovy Vary, neither the specific nor the unspecific factors of the mineral water instigate appositional bone growth. The destruction of osseous tissue ceases. Teeth with a low degree of mobility again become firmly imbedded. The gingiva stops bleeding and becomes normal in color and rigidity.

It is advantageous to repeat the treatment every year until the injurious factors such as diabetes mellitus, premature menopause and so forth have ceased to influence unfavorably the condition of the periodontium.

In the majority of instances, the necessary prosthetic correction can be applied with best results after completion of treatment.

Although balneotherapy does not cure periodontal disease completely in all instances, an essential improvement is obtained in the majority of patients treated.

The only unfavorable complication in balneotherapy consists in an activation of previously existing apical and pulpal symptoms in isolated instances. This complication sometimes is followed by loosening of the cement or cast metal fillings and of crowns, inlays and bridges.

Laboratory experiments and clinical experience, however, have established that these phenomena are not caused directly by the chemical properties of the Karlovy Vary mineral waters, but result indirectly from primary or secondary caries present prior to treatment.

Herpetic stomatitis

Lawrence M. Benzuly. *J. Periodont.* 27:216-224 July 1956

Herpetic stomatitis is seen clinically as primary or acute herpetic gingivostomatitis and secondary or chronic recurrent herpetic gingivostomatitis. The acute form is a generalized systemic infection; the chronic form is not.

Herpetic gingivostomatitis is an infectious disease caused by the herpes simplex virus, and is so widespread that it occurs in three fourths of the adult population. Manifestations of the primary form occur in children whose ages range from a few weeks to 14 years, although the great-

est number of instances occur in the one to three year old age group.

The disease is spread by direct exposure or contact. The saliva contains the herpes virus during and between attacks. The most frequent source of infection for children is adults. The virus can be transmitted in saliva and other secretions of the body during the clinical course of the disease. The virus invades the epithelium on contact, multiplies in the cells and produces a cellular hyperplasia. It spreads to contiguous tissues, by unknown means. The virus invades the bloodstream, and is disseminated throughout the body, causing metastatic lesions. The virus may also spread through the central nervous system, from axon to axon along the peripheral nerves.

The lesions of all herpetic infections are similar. As a general rule, they are larger in the recurrent form, with deeper ulcers being formed. The lesions are round or oval vesicles varying in size from that of a pinhead to several millimeters in diameter. The vesicles are filled with a clear, yellowish, watery fluid containing the herpes simplex virus and degenerating cells. The stage of the vesicle formation is relatively short, especially in the mouth. The trauma during eating and the maceration in the saliva cause the lesions to rupture and form shallow ulcers. Within a few days healing takes place with a yellow, thick, cheesy material forming over the surface of the large, ulcerated areas. After 10 to 14 days the lesions disappear.

The acute form of herpetic gingivostomatitis manifests itself as an acute systemic infection. A sore mouth is the most frequent complaint for 24 to 48 hours preceding the appearance of the vesicles. The prodromal symptoms are a high rectal temperature ranging from 99° to 106° F., accompanied by submental, submaxillary and cervical lymphadenopathy. The fever subsides usually on the appearance of the ulcers or within 72 hours thereafter.

In the clinical stage the gingiva is tender and swollen (sometimes almost covering the teeth) with a tendency to bleed easily. Feter oris is always present in instances of primary herpes simplex stomatitis. The most common sites involved are the buccal mucosa, tongue, gingival and inner surfaces of the lips, and sometimes the floor of the mouth, trachea, tonsils, esophagus, larynx,

soft palate and the nasal mucous membranes.

Recurrent herpetic gingivostomatitis occurs usually in older people. The trigger mechanism is unknown but is thought to be any one of a number of factors which tend to lower tissue resistance. Among the specific aggravating factors may be the following: allergy (especially such foods as walnuts, oatmeal and chocolate); trauma from dental operations; psychosomatic disturbances; exposure to bright sunlight; menstruation; upper respiratory infection; common cold and so forth.

The disease is unalterable in its three stages—prodromal, active and convalescent—and does not respond to curative measures. The treatment in primary herpetic infection is supportive and symptomatic. Steigman and others use 1 per cent methylosaniline chloride applied locally or one to two doses of chromium trioxide. Alkaline mouthwashes for the relief of acute symptoms and removal of debris may be helpful. Antibiotic troches may be used to help reduce bacteria in the mouth. Local caustics have been used to treat the chronic recurrent form.

Emotional status of patients with acute gingivitis

Hyman Goldberg, Walter J. Ambinder, Lawrence Cooper and A. Leonard Abrams.
New York D.J. 22:308-318 Aug.-Sept. 1956

Almost every report related to the etiology of acute necrotizing gingivitis refers to the emotional factor. This study considers the possible importance of "acute emotional stress" and certain personality variables to periodontal disease.

All patients referred to the periodontics section of the dental clinic at Camp Kilmer, N.J., during an eight week period were selected for the study. After the patient had been examined and a case history recorded, the patient was advised that a study was being conducted in conjunction with the neuropsychiatric service of the Hospital, but the exact purposes of the study were not divulged.

Sixty-six patients manifesting acute necrotizing gingivitis or gingivitis were tested and interviewed. Patients with acute necrotizing gingivitis tended to have a more disturbed personality ad-

justment than those with gingivitis. Prior to the current attack a significantly greater proportion of the group with acute necrotizing gingivitis had had some emotional stress which may have precipitated this episode. There was no check on the validity or reliability of the interviews. Results of testing the patients with the Minnesota Personality Inventory and the Rappaport version of the Word Association Test did not reveal any personality differences between the groups.

The continued tension or stress which the patient with acute necrotizing gingivitis encounters tends to aggravate his precarious physiologic adaptation. Of the group with acute necrotizing gingivitis, 41 per cent had had either severe or moderate stress just prior to their illnesses, whereas only 15 per cent of those with gingivitis had had any type of difficulty.

A removable-fixed periodontal splint

Paul N. Baer, Frank J. Malone and C. Rhodes Boyd. *Oral Surg., Oral Med. & Oral Path.* 9:1057-1059 Oct. 1956

The necessity of splinting an entire arch with a full complement of teeth arises from time to time as a part of periodontal therapy. The ideal type of splinting consists of preparing all the teeth in the arch for full coverage and then joining the individual abutments into one continuous fixed splint; but this method may be too expensive for many patients. A splint is described that affords rigid stabilization for an entire arch with a full complement of teeth, and that is esthetic and inexpensive.

The splint combines the esthetics of stainless steel wire in the anterior region of the mouth with the rigidity of a cast continuous splint, as described by Friedman (1953), for the posterior segment. The splint should be removed and recemented at regular intervals of from three to four months, when the patient has his periodic prophylaxis and periodontal examination.

The splint is constructed so that the casting is both above and below the heights of contour of the teeth, to give maximum stability. The splint is constructed with two free ends, one on each side, to permit placement. Before the splint is

seated in the mouth, the inner surfaces of the posterior portion of the splint are coated with a slow setting cement or periodontal dressing. Immediately on placement the splint is wired in place by means of steel wire inserted interproximally. The anterior wiring is accomplished by threading the stainless steel wire through holes which are made in the appliance before it is placed.

Temporary splinting for multiple mobile teeth

Marvin Simring and Jack L. Thaller. *J.A.D.A.* 53:429-434 Oct. 1956

A simple, rapid, efficient and economical method of splinting multiple loose teeth, as an aid to periodontal therapy, has been developed. The method involves simple ligation of the teeth followed by application of a self-curing acrylic resin so that the ligature becomes embedded in the resin. A continuous fixed splint around the entire upper or lower arch may be accomplished, if necessary.

The materials used are white, braided, silk ligature or braided, dead, soft, stainless steel ligature (U.S.P. size 0); self-curing acrylic resin; straight and contra-angle sable brushes (size 00), and single strand, dead, soft, stainless steel ligature 0.007 inch in diameter.

The teeth are ligated with either the braided wire or silk. For the posterior teeth, the ligature is placed at the height of contour (the greatest buccolingual diameter), circling each tooth twice in a double loop which provides added retention for the acrylic resin. It may be necessary to insert temporarily a supraocclusal wire, 0.007 inch in diameter, to hold the arch wire in place during placement of the braided ligature and application of the acrylic resin. The supraocclusal wire is removed on completion of the resin application.

For the anterior teeth, the ligature, wound around the teeth in a figure eight manner, is placed incisally to the cingulum but gingivally to the contact point. An alternate method of ligation may be used in which a double loop is tied to encircle two or three teeth of comparable anatomy. For convenience, a separate piece of liga-

ture may be used for each loop. For the posterior teeth, the ligature is placed at the buccolingual height of contour and gingivally to the contact point.

Where the contact point between teeth is tight or inaccessible, a loop of fine spring steel wire, 0.006 inch in diameter, may be used to pull the ligature between the teeth.

Acrylic resin is applied by the nonpressure method. Right-angle sable hair brushes, size 00, are useful in reaching the distal surfaces of molars. Where it appears likely that the acrylic resin may impinge on the interproximal gingiva, wax may be packed into the interproximal regions before the resin is applied. A dry field of operation is essential.

This method of splinting has the following limitations: the splint is subject to fracture unless caution is exercised in checking the occlusion; the splint makes it difficult to clean the teeth and massage the gingival tissues; temporomandibular joint disturbance due to occlusal aberration may result from the rigidification of a mobile tooth in supraocclusion; the bulkiness of the splint may annoy the patient, and the appliance may act as a food trap.

The patient must cooperate in the treatment. Diligent home care is essential, as is a regular checkup. The splint should be removed after not more than four months, and a thorough prophylaxis and examination performed.

This method of splinting makes firm and stable all members of the dental arch, to permit effective periodontal procedures. The method is applicable to all quadrants of the mouth.

Gingivitis and Vincent's infection in children

Marcu Brucker. *J.Den.Children* 23:116-134 June 1956

In a study undertaken to evaluate the importance of the bacteriologic smear in the diagnosis and treatment of Vincent's infection, a group of 14,604 white and negro children of both sexes representing 14 nationalities was investigated. Their ages ranged from 5 to 16 years inclusive, and their socioeconomic levels varied widely.

In the group, 136 children had very slight gingivitis, 807 had slight gingivitis, 217 had moderate gingivitis and 332 had severe gingivitis.

The incidence of positive smears was higher in the white girls than in the white boys and lower in the negro girls than in the negro boys. The negro children showed a substantially higher incidence of positive smears than did the white children. This suggests that race plays an important part in susceptibility to this infection, and that negroes have a lower tissue resistance to it than do white children.

The hypothesis that girls are more resistant to Vincent's infection because of their inclination to better habits of oral hygiene was only partly substantiated. Social status seemed to play no definite part in susceptibility.

The microorganisms found in Vincent's infection are not normally present in all healthy mouths. Of 906 children with apparently healthy mouths, only 88, or 9.7 per cent, had positive smears; 818 had negative smears.

No relationship could be established between caries and gingivitis or between caries and Vincent's infection.

The statement that the microorganisms found in Vincent's infection are present in practically every mouth is erroneous. The clinical features of the disease are inconsistent, and so do not supply a criterion for correct diagnosis.

The investigation proves conclusively that appropriate bacteriologic tests are necessary for the positive diagnosis of Vincent's infection.

Bruxism, diagnosis and treatment

Donald S. Moore. *J. Periodont.* 27:277-283
Oct. 1956

Bruxism, usually a subconscious habit of which the patient is unaware, is one of the most important etiologic factors in periodontal disease and the loss of teeth. A study of 606 cases reveals the following apparent causes of bruxism: tension; habit; hyperthyroidism; worry and hurry; interference in the occlusion; gastric and intestinal disturbances; anger; occupational stress; clenching to keep the mouth closed to overcome snoring or mouth breathing; inflamed periodontal mem-

branes, which create the urge to clamp down on the teeth; nasal and pharyngeal infections in children, and wearing heavy metal palates of partial or complete upper dentures.

Because most patients are unaware of clenching or grinding their teeth, the dentist must be on the lookout for bruxism. Among the signs and symptoms which indicate the habit are the following: abnormally well-developed muscles of mastication (except in those who eat foods requiring heavy mastication); McCall's festoons at the gingival margin of the teeth; worn facets on areas of the teeth that do not touch during normal chewing excursions; the luxation of the teeth buccolingually under grinding pressure; rigid jaw muscles; recessions; sensitive root surfaces; temporomandibular joint disturbances; loss of alveolar bone around teeth; contraction of the masseter or temporalis muscles; teeth hypersensitive to vitality tests where there are no cavities or fillings; pain within the alveolar process, and blanching of the gingival tissues when the teeth are under biting stresses.

Bruxism is not confined to the natural dentition. Flattened alveolar ridges beneath dentures are a common, but rarely diagnosed, result of bruxism.

Clenching of the teeth is a common occupational habit, particularly for operators of tractors, cranes and bulldozers, and for persons lifting heavy objects. Any physical exertion induces some people to tense every muscle in the body, including the muscles of mastication.

In treating bruxism, the correct diet, rich in calcium, phosphorus and vitamin B and D, is important. Any gastrointestinal disturbance must be overcome with the cooperation of the physician. Many patients stop the habit when the occlusion is equilibrated, or when the partial dentures are relined and the interference of the rests removed. Tension is the commonest cause of bruxism and the most difficult cause to overcome because it requires the cooperation of the patient.

Treatment of bruxism consists of three phases: (1) a sympathetic understanding of the patient's problems; (2) teaching the patient how to relax, and (3) providing the patient with a program for overcoming the tension.

For the patient who is not successful in breaking the habit, an appliance must be made for him

to wear at night, in order to reduce the effects of the habit. A different type of appliance—a soft rubber or plastic bite positioner, a clear acrylic bite plane for upper and lower jaw, a Hawley bite plane, and so forth—is used, depending on the circumstances of each patient. The appliance must be worn as long as the habit persists.

Treatment of periodontal diseases with procaine hydrochloride

(Traitement des parodontopathies par la novocaïne)

L. Marcus. *Inform.dent., Paris* 38/1
307-312 March 1, 1956

In dental and medical literature, many authors have claimed success in treating neuritis, pulpitis, periodontitis, periodontosis and disturbances in the eruption of third molars with infiltration anesthesia using procaine hydrochloride.

The validity of these reports has been checked recently in tests with 71 patients. Among the patients examined were 24 with a complicated apical periodontitis; 20 with a rather simple inflammation of the periodontium; 16 with a severe periodontosis, and 11 with slight degenerative disturbances of the periodontal membrane, the gingiva or the alveolar bone. With the exception of three patients with disturbances of their alimentary function and with malnutrition, all patients showed a favorable healing process. Re-examination, 18 months later, revealed no unfavorable changes.

In 53 of the 71 patients, no preliminary treatment (not even the elimination of calculus) had been attempted so as not to disturb the curative effect. Treatment consisted in the injection of from 3 to 4 cc. of procaine hydrochloride solution (0.5 per cent) without epinephrine, given in eight different places in the oral cavity. From six to ten appointments with intervals of from two to three days were necessary. The injections in the upper jaw were made in the region of the molars and between the cuspids and lateral incisors; in the lower jaw, in the region of the molars and between the lateral and the central incisors.

After injections, a calorogenic effect occurred which lasted for about two hours. Sleep was

deeper than normal. Only in a few instances were unfavorable reactions observed. In instances in which the edema caused by infiltration did not fade, clinical and roentgenographic examinations revealed the presence of focal infection, cysts, granulomas, apical rarefaction, nonvital pulp or sinusitis. The recrudescence of focal infections caused by a comparatively mild irritation such as is produced by a 0.5 per cent injection of procaine hydrochloride can be expected (Huneke).

Dentists who have difficulty in obtaining the desired result with procaine hydrochloride or its equivalent should consider customary methods such as elimination of calculus, cleaning of periodontal pockets under anesthesia, and—if necessary—a functional grinding of the teeth.

A careful clinical and roentgenographic examination is necessary to reveal whether focal infection is present, and to prevent undesirable reactions.

The importance of humoral and trophic factors in the development of periodontal disease (Considérations sur le rôle des facteurs humoraux et trophiques dans la constitution des parodontoses)

P. Friez, Paris. *Parodontol., Zürich* 10:74-89
June 1956

Periodontal diseases are almost always related to systemic disturbances, a fact which should be of fundamental importance in diagnosis and prognosis.

This conception is not new, but many authors have hesitated to report on this aspect of periodontal disease because it is difficult to obtain adequate data on this relation, and also because the literature on periodontal disease mainly considers local factors as causative agents.

Periodontal disease, however, should be considered rather as a disease of the osseous structures of a rarefactional type. The alveolar bone is ideal for an analytic observation of the condition of bones in general. The pathology of the alveolar bone should not and cannot be isolated from that of the entire bone structure.

The decalcification process of bones may be divided into two fundamental groups: osteopo-

rosis and osteomalacia. Because it is often difficult to distinguish between these two groups, the term "bone atrophy" has been adopted. If this term is accepted universally, a division should be made to differentiate between the causative factors such as endocrine, hepatogastric and neuropsychic factors.

Endocrine factors such as sex hormones may cause catabolic or anabolic osteoporosis, but they do not affect the alveolar bone alone; they may produce or promote disturbances in other osseous structures.

The metabolisms of calcium and phosphorus are related closely to the digestive system. They can be affected in numerous ways, grouped together under the term hepatogastric or nutritional factors.

Neuropsychic factors may simulate endocrine or hepatogastric disturbances. It has been established that periodontal disease often is associated with nervous or emotional disturbances.

Pathologic bone disturbance usually is one of the main underlying causes of periodontal disease. It is suggested that a thorough medical and dental examination and a careful study of the patient's past history should form the basis of rational therapy.

▼ Endodontics

Treatment [of] vital exposed primary and young permanent teeth

Charles A. Sweet, Jr. *Texas D.J.* 74:286-288
June 1956

It is imperative that the child's dental integrity be kept intact for the preservation of space, function and the elimination of infection.

Both the bitewing and periapical roentgenograms are necessary to diagnose the pulp in deciduous teeth. All vital exposed deciduous teeth may be treated successfully unless any of the following conditions prevail: a history of unpro-

voked toothache; sensitivity to percussion; the root or roots more than two thirds absorbed; abnormal mobility; odor or presence of suppuration, and periapical involvement.

For successful treatment of the deciduous pulp, the pulp filaments in the canaliculi must be vital; the field of operation must be kept dry and free from contamination; the tooth opening must be sufficiently wide so that all portions of the pulp chamber may be seen, and medicaments strong enough to destroy all forms of bacteria must be used. Deep, profound pulpal anesthesia is imperative.

When the anesthetic has taken effect, the deciduous tooth is isolated with a rubber dam or cotton rolls. The field of operation is washed with 70 per cent alcohol and dried with warm air. The cavity is prepared with a no. 701 or 557 fissure bur in the contra-angle handpiece. The caries is removed with a sharp spoon excavator, after which the top of the pulp chamber is removed with a clean fissure bur. The pulp chamber is excavated with either medium-sized sharp spoon excavators or a no. 6 round bur. All the bulbous portion of the pulp is removed. The hemorrhage is controlled and the pulp cleaned with a solution of procaine hydrochloride on a cotton pledget. The bur should be run counterclockwise so as not to disturb the pulp filaments in the canaliculi. After the pulp chamber is dried, a dressing of cresolated formaldehyde on a cotton pellet is sealed in the pulp chamber with zinc oxide and eugenol, for from three to five days.

At the second appointment the zinc oxide and eugenol dressing is removed, any stain or bloody exudate is removed, and a dressing of creosote is sealed in the chamber with temporary cement for from three to five days.

At the third appointment the temporary cement and creosote are removed and the pulp chamber is filled with a thick creamy paste made of equal parts of cresolated formaldehyde and eugenol. The remaining portion of the pulp chamber is filled with crown and bridge cement, allowing sufficient cavity space for the tooth to be restored with silver amalgam.

In vital pulpotomy in permanent teeth, a paste made of calcium hydroxide and distilled water is used. The restoration of choice is a gold inlay.

Japanese woodcut (1846)
depicting the treatment of a cystic tumor
beneath the tongue



Professional activities



History

New impulses for international dentistry through the modern Japanese dental literature (Impulse für die Zahnheilkunde durch japanische Fachliteratur)

Hugo Bergemann. *Zahnärztl. Mitt.* 44:616-617
Sept. 1, 1956

Since the end of World War II, a change in the Japanese attitude toward science and education has taken place. In addition to learning from, and sometimes improving on, the West, the Japanese always have been eager to profit from lessons learned from their own experience.

Although Japan has borrowed widely from scientific and educational knowledge achieved in other countries, there were, even prior to World War II, certain special and peculiar features characteristic of Japanese education. The first of these was that the Japanese educational system at-

tempted to combine recognition and acceptance of Western science and technology with traditional Japanese values and ideals. Courses in astronomy, biology, chemistry, physics, medicine and dentistry were made available to all Japanese students who proved capable of understanding these topics. Japanese researchers, employed by the government or by universities, made notable contributions in many of these sciences. In general, Japanese education still relies on Germany for studies of natural sciences and medicine, on France for the studies of art and law, on England for the studies of commerce and literature, and on the United States for the studies of engineering, technology, chemistry, pharmaceuticals and dentistry.

Little of the important scientific progress of modern Japan reaches the other countries. The reasons lie in the geographic position of Japan, in the shyness and reserve the Japanese usually exhibit in relations with strangers, and especially in the difficulties of the Japanese language.

Therefore, Japan's development from the "country of silk and porcelain" to a modern nation progressive in science and economics has been almost unnoticed by the outer world.

In the beginning of this century, Japan imported dental instruments, materials and other dental supplies from the United States, England and Germany. In 1918, the first factory was opened in Tokyo to manufacture artificial teeth



Japanese woodcut (1355)
by Takhi Kaizhan,
demonstrating the treatment
of periodontitis

fitting in shape and color the characteristics of Japanese natural teeth. Later, dental instruments and equipment, furniture for dental offices, prosthetic and filling materials and drugs were manufactured in Japan. These products are of such a high quality that at present the young Japanese dental industry exports to India, Pakistan, China and Australia.

Dentistry as a science developed rather slowly. Until 1850, dental treatment was given by physicians only.

In a 30 volume work on medicine, surgery and dentistry published in 1644, the author, Tamba Yasiori, personal physician to the Emperor, mentions and explains such terms as "pyorrhoea alveolaris," "osteitis" and "gingival hemorrhage."

Hoshino Ryotsu (1754-1802) wrote a work on the treatment of mandibular fractures, and another on the anatomy of the temporomandibular joint.

Hanaokhu Zhuikhen (1760-1853) reported on surgery in cleft lip and cleft palate under opiate anesthesia. The illustrations accompanying his work show that oral surgery was performed in Japan during the Kamakura period (1192 to 1335).

Prosthetic dentistry was in the hands of skilled dental technicians, and artificial dentures made of wood (in the seventeenth century) were superior to those made in Europe.

Dentistry in Japan as an independent science began in 1868. American dentists were the first to train Japanese students. A short time later, dental colleges were created, patterned after the American dental schools. Japanese dentistry developed to a major science.

Recently, several textbooks have been translated from the Japanese into English and German. Japanese dental journals prove to the world that outstanding work is being performed, especially in the treatment of cysts of the mucosa, in caries etiology and prevention, in orthodontics and prosthetics.

Although the correct translation of Japanese dental literature requires cooperation between a Japanese dentist who has mastered both languages and an American or European dentist, international dentistry should not and must not exclude the contribution of Japanese scientists, researchers and dental specialists.

▼ Dentistry around the world

The dental profession in Switzerland

(Der Zahnärzterberuf in der Schweiz)

Walther Müller, Zurich. *Zahnärztl. Rundschau* (Student. Rundschau) 14:12 June 5, 1956

The comparatively poor dental condition of the Swiss population gives the young dentist an excellent field of activity.

Before a student decides to become a dentist, however, he should judge whether he possesses the high principles and the intellectual and physical qualities essential for this profession.

Although the activities of a dentist differ from those of a physician, they are at least as strenuous. The physician must be ready day and night, he must be willing to travel great distances to visit patients who need him, and neither weather nor personal fatigue can be taken into consideration. The dentist spends long hours, often without a pause, in an unnatural standing position, concentrating on rather small objects (the oral cavity or parts of it, natural or artificial teeth, crowns, inlays, bridges, complete or partial dentures). A weakened organism, existing afflictions of hands, legs or feet, and previous severe diseases, external or internal, should deter a student from selecting dentistry as his profession.

For a healthy and intelligent student, however, Switzerland is an excellent country in which to study dentistry.

Scientific dentistry in Switzerland began in 1862 with Billeter's lectures on dental care and health. In 1895, the first Swiss dental school was created in Basel.

Today, four important dental colleges, each attached to the medical faculty of a university, exist in Zurich, Basel, Berne and Geneva. The curriculum of the dental colleges for the first four semesters is identical with that of the medical schools. After attending these courses, the student has to pass an examination on general medicine. Then follows a training period in the special branches of dentistry and medicine, and clinical experimental education in dental special branches. The study is concluded with a final examination

and the submitting of an original dissertation to the dental faculty as fulfillment of the degree of Dr.med.dent.

The theoretical and practical education in a Swiss dental school develops systematically the firmness of character and the standards of professional ethics necessary for dental practice.

After studying 12 semesters, the young graduate usually works temporarily as a dental assistant or he completes his education by taking post-graduate work at a foreign dental college (mostly in the United States). Many dentists now practicing in Switzerland have acquired the degree of D.D.S. in the United States.



Dentistry in government

Some aspects of the work of A.D.A. at the National Bureau of Standards

George C. Paffenbarger. *Xi Psi Phi Quart.* 55:6-9 Oct. 1956

Although dentistry became a distinct profession over a hundred years ago, it had no standards for dental materials until 1926 when Dr. Wilmer Souder and his co-workers at the National Bureau of Standards proposed a specification for dental amalgam. Since 1928 the American Dental Association has maintained a research group at the National Bureau of Standards. This present A.D.A. staff of nine is formulating standards for dental materials; testing products for compliance with these standards; developing new and improving old dental materials, instruments and test methods; conducting basic research on the structure of hard tooth tissues, and producing motion pictures showing how much of the laboratory research may be transferred to chairside dental practice. This work is under the supervision and direction of the National Bureau of Standards.

The program has taught that price and personal testimonials of users are not necessarily reliable criteria for the selection of dental materials, and that the physical and chemical properties of

the materials and the influence of technic on them are the true guideposts.

Specifications or standards for materials are necessary in any highly developed technological society, and the program of the A.D.A. at the National Bureau of Standards has centered around the formulation of specifications for dental materials. In 1955 the Association collected its specifications in a brochure titled *American Dental Association Specifications for Dental Materials*. It is planned to publish this document annually. Currently, there are specifications for the following materials: amalgam, inlay casting investment, impression compound, inlay casting wax, inlay casting gold alloy, mercury, wrought gold wire alloy, zinc phosphate cement, silicate cement, hydrocolloidal impression material—agar type, denture base resin, denture self-curing repair resin and chromium-cobalt casting alloys.

Current work is in progress on the development of gallium-based alloys as possible substitutes for amalgam and of epoxy resins as direct filling resins.

A motion picture on some phase of the work is produced annually. These are available on loan from either the American Dental Association or the National Bureau of Standards. Visitors are welcome at the dental research laboratory.

Dental training for emergency care of mass casualties

B. W. Oesterling. *U.S. Navy M. Newsletter* 28:2-5 Sept. 7, 1956

During peacetime the job of caring for the dental ills of Navy personnel occupies the time of dental personnel. During wartime battle conditions, however, the dental officer (and the dental technician) must lay aside his health pursuits to become a partner of the medical officer in caring for battle casualties. In every ship where there is a dental department, dental officers and dental technicians will be placed with emergency battle dressing station teams and will be expected to be able to assume the responsibilities of treatment that may arise. During World War II dental officers showed they could assume these lifesaving responsibilities.

Recent developments in nuclear warfare have made the training of dental officers, dental personnel, and all their civilian counterparts a necessity if the minimum casualty needs are to be met should atomic warfare come. Training of dental personnel in first aid is being given in the six dental technician training schools and in the Naval Dental School.

The dental division of the Bureau of Medicine and Surgery has developed a 35-hour course in personnel damage control. The course covers the following emergency conditions: dentistry—an aid in disaster; battle dressing station duty; psychological first aid; field anesthesia; head and neck wounds; chest wounds; abdominal wounds; control of hemorrhage; fractures; cricothyroidotomy; resuscitation; burns; casualty treatment of shock; parenteral therapy; new medicaments; dressings; bandages and splints; transportation of the injured, and radiation injury.

Dental personnel from the Atlantic Fleet will be trained at the Naval Dental Clinic, Norfolk, Va., and the Naval Training Center at San Diego, Calif., will train Pacific Fleet dental personnel. It is planned to extend the training eventually to reserve dental officers who reside near these training facilities.



Forensic dentistry

Faith healers, miracle men and the German Supreme Court (Heilapostel, Wunderdoktoren und das deutsche Bundesgericht)

E. Heinrich. *Deut.Zahnärztebl.* 11:437-438
June 8, 1956

In Germany, many seriously ill, hopeless and desperate persons are streaming to faith healers, miracle men and women and charlatans who promise universal cures by magic charms and spells, by laying on of the hands or by exorcism of the devil.

No official statistics reveal the extent of such activities in present-day Germany. The recent

seizure of several criminal charlatans made the medical and dental associations recognize the danger to the health condition of the German people that existed because of the lack of sense and judgment, blind trust and implicit faith in claims and promises of charlatans.

Until now, it has been difficult to check this activity, because only when the practice of pious fraud had been demonstrable could the culprit be punished by law. Treatment by necromancy was not covered by criminal laws. Fraud is difficult to prove when the healer believes himself to possess supernatural powers, and when the patients are convinced that the charlatan knows more about medical and dental science than licensed physicians and dentists.

In one recent case of criminal witchcraft and quackery, however, the German Supreme Court ruled as follows: "Practice of the medical and dental art is involved in every activity directed toward the cure of diseases, afflictions and bodily injuries even if claimed that it will be obtained by supernatural powers with alleged or imagined metaphysical forces. The activities of faith healers, miracle men or women and of all medical charlatans contradict the meaning of the German Civil Law regulating medical and dental practice. Therefore, the activity of such unlicensed persons is a sufficient basis for conviction. The establishment of willful fraud is not necessary."

Topics of forensic dentistry (Notes for students) I. General study of forensic dentistry (Temas de odontologia legal—Apontamentos para estudantes. I. Generalidades sobre odontologia legal)

A. Samico. *Pernambuco odont.* 7:5-16
Oct.-Nov.-Dec. 1955

Dentistry by its own merits has raised itself from its low position of the past to a point where it was considered a branch of medicine and later on to even a higher position. Today dentistry is considered a valuable independent science.

Forensic dentistry deals with professional problems concerning the public and the law. It sets up the standards for the preparation of laws aimed at solving professional, social and moral problems of

clinical and preventive dentistry. Forensic dentistry is an autonomous science in that it is no longer linked to legal medicine. Both sciences, however, have several aspects in common and complement each other.

The autonomy of forensic dentistry is recognized by the laws of all civilized countries, by those of authorized organizations of members of forensic medicine, forensic dentistry and criminology and by resolutions of congresses including those of the First Panamerican Congress of Legal Medicine, Legal Dentistry and Criminology. Most members of this congress were physicians, professors of forensic medicine, dentists and criminologists.

Forensic dentistry is in constant progress. This is due to several factors: (1) the great advances of dentistry, (2) the better understanding of the relationship between the teeth and the dental structures and health, and (3) the increasing number of legal implications that are constantly being added to procedures of forensic dentistry. Forensic dentistry gives dentists and the public the most valuable data for the preparation of laws on dentistry, applied forensic dentistry, and social dentistry.



Trade and laboratory relations

Illegal practice (Intrusismo)

Antonio Calle Guevara. *Rev.A.odont.Argentina* 44:259-260 June 1956

The problem of illegal practice should be the concern of professional men, public health authorities and sociologists.

Society has enacted laws that aim to defend public health against adventurers who, without adequate knowledge and training, invade the practice of the healing arts for their own profit. The credulity and ignorance of the public, plus its complicity with these free lancers, make it difficult to eradicate the problem.

Most illegal dentistry takes place in the prosthetic field. The fabrication of laboratory pros-

theses is taught in official and private institutions to many more people than the dental profession requires as technicians.

This problem is more acute in some areas of the country (Argentina), and also exists in other countries.

It is the dental profession's duty to consider this problem, educate the public, and help the public health department.

The illegal lab question: many problems—some solutions

Edgar T. Stephens. *Illinois D.J.* 25:280-282 May 1956

Methods to solve some of the problems relating to the illegal operations of some dental laboratories are as follows:

1. Secure evidence and encourage criminal prosecutions against dental technicians who violate the Dental Practice Act.
2. Establish a routine program of securing evidence and prosecuting such technicians through injunctive proceedings.
3. Investigate all dentists having relations with dental laboratories except as provided in the Dental Practice Act. Where violations exist, bring the dentists before the Board of Dental Examiners on license revocation charges.
4. Revise the Dental Practice Act in the following ways: Make mandatory the issuance of work orders by dentists to laboratories; prohibit referral of patients to dental laboratories; license and place dental technicians under the responsibility of the Board of Dental Examiners, and strengthen the act by clarifying it and eliminating ambiguities.
5. Enact legislation whereby a person licensed to perform services will lose his license automatically if he is convicted of violating the provisions of the law.
6. Educate the public and the dental profession concerning the illegal practice of dentistry carried on by certain laboratories.
7. Emphasize to the courts the health hazards for the public resulting from the operation of illegal laboratories.

8. Encourage dental schools to devote more time to the study of ethics, public and professional relations, dental laws, and the proper relations between dentists, laboratories and the dental trades.

9. Help more dentists to become proficient in the repair of dentures.

10. Speed the making and delivering of dentures.

11. Provide some means in the community to supply low cost dentures to the dentally indigent.



Education

Medical and dental education in the Philippines

Gregorio Hernandez, Jr. *Philippines M.D.J.*
2:16-19 May-June 1956

When Spain colonized the Philippines, she brought with her not only the Catholic religion but European culture, including the knowledge and practice of dentistry. The science of dentistry was learned by apprenticeship from the French and the English who came to practice in Manila in the latter part of the Spanish regime.

The first attempt at formal training in dental science took the form of a two year course offered by the Facultad de Medicina of the University of Santo Tomas about 1898. Those completing the course were called "Cirujanos ministrantes," and were allowed to serve as male nurses and sanitary inspectors. In remote places they were permitted to minister to the needs of the sick, in the absence of a physician or dentist.

Dentistry became recognized as a separate profession during the American regime when, on January 10, 1903, the Philippine Commission passed act no. 593, a dental statute, which defined the scope of dental practice and called for the raising of the professional and ethical standards of dentistry. A group of Filipino dentists founded the first dental professional society in the country, the Sociedad Dental de Filipinas. The first dental school was established under the

Liceo de Manila and renamed Philippine Dental College, in 1913. In 1915 a second dental law was enacted, which restricted the practice of dentistry to dentists who had finished the three year course with the degree of Doctor of Dental Surgery. The dental course was later lengthened to four years, entitling the graduate therefrom to the degree of Doctor of Dental Medicine.

On July 17, 1949, act no. 417 was enacted, stipulating that two years after passage of the law, students entering dentistry should produce evidence they had completed a two year pre-dental course acceptable to the Board of Dental Examiners.

Today most dental teachers are recruited from graduates of local schools, a practice that promotes inbreeding. There is no formal teacher training program for teachers in dentistry. Enrollment in the nine private dental schools in the Philippines, not including the College of Dentistry of the University of the Philippines, has been as follows: 1948-49, 2,947 students; 1949-50, 3,065; 1950-51, 5,250; 1951-52, 4,736; 1952-53, 2,760; 1953-54, 2,600; 1954-55, 2,002, and 1955-56, 1,768. The downward trend in enrollment should be studied and appropriate steps taken to promote interest in the dental profession without sacrificing the standards and the quality of training.

The Philippines, with a population of about 23,000,000, today have about 6,000 to 7,000 dentists.

Dental education in the United Kingdom

H. H. Stones and F. E. Lawton. *Internat.D.J.*
6:416-430 Sept. 1956

Of the 16 dental schools in the United Kingdom, 3 are in Scotland, 1 in Northern Ireland and the remaining 12 in England, 5 of these being in London. All 16 schools are affiliated directly with universities. Three other bodies which conduct examinations in dentistry and award diplomas are the Royal College of Surgeons of England, the Royal College of Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow.

The 16 dental schools can accept a maximum

of about 635 new students each year. The actual number admitted annually has fallen gradually from 633 in 1951 to 555 in 1955. The proportion of women students shows a tendency to increase; in 1955, 97 of the beginning 555 students were women. In the past five years the average number of overseas students commencing dental studies in the United Kingdom has been 27 Norwegians and 48 others.

Even if the schools were filled to capacity the number qualifying would be insufficient to meet the need for dentists. The government recently set up an Interdepartmental Committee under the chairmanship of Lord McNair to enquire into the reasons for the shortage of entrants to the dental profession.

Educational requirements for admission to a dental school are usually based on the General Certificate of Education examination which the candidate is required to pass in English language, a language other than English, mathematics or an approved science, and in two or three other subjects. Two qualifications, the degree of Bachelor of Dental Surgery and the Licence in Dental Surgery, entitle a person to registration in the Dentists' Register. There is a tendency in the universities to eliminate the Licence and to accept students only for the degree course.

The curriculum has been modified to change the emphasis from the mechanical to the biological aspects of dentistry. The instruction required in dental mechanics has been reduced from 2,000 to 800 hours, and is being more closely related to clinical prosthetics. The student is now introduced to clinical problems and practice almost immediately on the completion of his studies in the basic sciences of anatomy and physiology.

More full-time teachers are being appointed in the dental schools, though the contribution which can be made by the part-time teacher is recognized. Within the past four years the salaries of university teachers have been increased and are now comparable with the average earnings in dental practice.

Nearly all the 19 examining bodies grant higher degrees or diplomas in dentistry. The universities award the degree of Master of Dental Surgery (M.D.S. or M.Ch.D.) to graduates of at least two years' standing who present a thesis recording the results of original research in a field

appertaining to dentistry. Grants for advanced study are available from a variety of sources.

Research is being more actively pursued in the dental schools. The British section of the International Association for Dental Research has been reconstituted. At its annual meeting in Birmingham in 1955, 64 research workers were present and 25 papers were presented.

Dental chairside attendants are being trained in some schools where, as part of the training, they give assistance to dental students. Dental technicians are trained by apprenticeship to a practitioner or to a commercial laboratory, supplemented by formal courses held at technical colleges in many larger cities. The City and Guilds of London Institute arrange theoretical and practical examinations in various centers and the trainee technician can show evidence of his progress by obtaining certificates of proficiency.

Experiments in dental education overseas

I. M. Chirnside. *New Zealand D.J.* 52:133-135
July 1956

Impressions received during a visit to England, Europe and Australia are reported.

In two dental schools in Sweden and in some English schools dental anatomy and histology are included in the first year of study together with anatomy, physiology and biochemistry. At the Royal College of Dentistry, Stockholm, however, a short course in occlusion has been added to this group.

In an experiment in progress at the London Hospital Dental School, University of London, basic studies are followed by a six month introductory course, immediately after which students begin clinical work of considerable diversity. The apposition of basic subjects and clinical practice achieved in the London experiment illuminates the teaching of both. When children's dentistry, conservation and periodontics are commenced early, clinical experience in these subjects is spread over two and a half years instead of the conventional one and a half years. Prosthetic laboratory technics are not studied until late in the curriculum.

The amount of technical work required of students in most schools in England and both schools

in Sweden remains fairly high. The use of technicians to lighten the burden of laboratory work—a principle well established in New Zealand—is not widely adopted.

In England a well-designed course of instruction for technicians is laid down by the City and Guilds of London Institute, and is available at technical colleges. It is a five year course, supplements an apprenticeship system and leads to a certificate. Advanced courses in crown and bridge, orthodontics and other technics leading to a diploma are also available at some technical and dental schools. The profession has encouraged this scheme through its representatives on the National Joint Council for the Craft of Dental Technicians and by acting as advisers, lecturers and examiners.

Again, in Sweden, organizations have been created for the training of chairside assistants and technicians, and a school for technicians is associated with each of the dental colleges. At the Royal Dental College, Stockholm, it is housed separately, although it is under the control of the Academic Council of the College. The college staff also provides instruction, but immediate supervision is in the hands of a master technician. Where applicable, technicians receive the same instruction and use the same textbooks as dental students. The course leads to certification of the technician by the Royal Medical Board, and this carries privileges and responsibilities. Examinations are conducted by members of the college staff and by general practitioners.

The future of academic dentistry

A. D. Hitchin. *Brit.D.J.* 101:147-151
Sept. 4, 1956

British dentistry attained autonomy in 1956 with the establishment of the General Dental Council. The profession can control its own professional standards and can stimulate the development of academic dentistry.

No profession can be greater than its educational system. The cultural background of the profession depends largely on academic dentistry. Academic dentistry does not consist merely in producing dental graduates with a sound educa-

tional background based on scientific training and able to perform common technologic procedures with a reasonable degree of skill.

Academic dentistry must have an expansive quality, it must generate new thoughts, new ideas, new knowledge, new technics. Research must be its goal. On research depends the truly preventive approach, and also professional status and in turn recruitment. It is more in keeping with British tradition for research to have its locus in the university dental schools. The stimulus of active research is needed in the dental schools; only when they are contributing to the extension of knowledge are they truly alive.

If dentistry is to occupy a high place, then all its teachers must be engaged in pushing back the frontiers of dental ignorance; research in a university discipline is as great a necessity as the transmission of knowledge to disciples.

Dentistry is different from all other university subjects in that teachers must supervise students doing operative work over long periods. The result is that time for research and even time for the analysis of his clinical findings can become increasingly difficult for the dental teacher to obtain.

There is a need for more dental surgeons with a greater training in science subjects. Although the amount of science taught appears to be adequate for the potential general dental practitioner, it is hardly sufficient for those who aspire to research. For the latter, an honors degree in physiology, anatomy or pathology is of great value.

Dental teaching departments are concerned not only with fundamental knowledge but with the teaching of its application to students in practical situations comparable to those with which they will be faced in practice. Both fundamental and applied research in dentistry are needed.

The cultural background of dental students can be raised by drawing students from all parts of the country and from abroad; by mixing the students of different faculties so that they may have an influence on each other, and by embellishing dental schools with artistic treasures and well designed buildings.

Since 1942 the British Dental Students' Association has had a considerable effect on many of its members. It has enabled dental students to

see other schools. It has helped organize the International Association of Dental Students, which has held annual conferences in Marburg, Groningen and Utrecht, and Malmö, and which this year is to meet at the Sutherland Dental School of King's College, Newcastle-on-Tyne.

The development of academic dentistry with more teachers, more research and increased facilities is necessary. On a solution to the dilemma between university freedom and state interference will depend the speed at which academic dentistry will move forward.

Dental and dental hygiene students: their characteristics, finances and practice plans

Walter J. Pelton, Quentin M. Smith, Elliott H. Pennell, Ruth D. Bothwell and James N. Ake. *J.A.D.A.* 53:343-358 Sept. 1956

This is Chapter 8 of a report of a cooperative study made by the Council on Dental Education of the American Dental Association and the Division of Dental Resources of the United States Public Health Service.

Questionnaires were completed by 1,432 students, representing 80 per cent of the 1,794 dental hygiene students enrolled during the 1953-54 academic year and 27 of the 31 dental hygiene schools in existence at that time in the United States.

The average age at graduation was 21 years. Only 5 per cent of the dental hygiene students were married. Thirty per cent had had some pre-professional college education and about one fifth worked outside school hours.

About one half of all students resided in rooming houses or dormitories, whereas nearly two fifths lived with parents, other relatives or friends.

Students came generally from families in the middle or high income brackets and their parents had better than average education. More than half of the fathers were employed in professional or managerial occupations, 8 per cent being dentists.

The average student expenditure for two years in school was \$3,039, one third of which went for

school items and two thirds for living expenses. Two-year school expense averaged \$977, of which \$644 went for tuition and fees, \$164 for supplies and equipment, \$88 for books and the remainder for incidentals.

The \$2,062 average two-year living expense was distributed as follows: \$622 for food, \$546 for personal maintenance, \$380 for lodging, \$199 for travel, \$166 for recreation and \$149 for all other expenses.

At the close of the school year about one fifth of the students were in debt, the median indebtedness for this group being \$1,210.

Eighty-five per cent of the students expect to practice in their home states, and more than 90 per cent in the region where the home state is located.



Literature

An average surgeon complains

Kenneth B. Castleton. *Surg., Gynec. & Obst.* 103:239-240 Aug. 1956

It is not uncommon for a surgeon to read an account of a new surgical procedure or technic by a prominent surgeon, to try out the procedure, only to find that the later results are not as favorable as the immediate results would indicate, and to discover that the procedure already has been discarded by those who introduced it without an adequate report of the failures. This is one of the great defects of current surgical literature.

There is too great haste in reporting new developments whose values are not proved, and there is a reluctance, or tardiness, in reporting unfavorable results. By the time the failure of the procedure is known, much harm already may have resulted. If the surgeon who first reported the procedure would be in as great a hurry to report his poor results as he was in his initial report, much of this difficulty could be avoided.

It would seem wise for the few surgeons interested in the new procedures, and who are in a position to study sizable groups, to study them

carefully and, from time to time, report on the follow-ups as the years go by. Surgeons in large clinics and large university surgical centers could combine their efforts and make cooperative studies and reports on their experiences in an effort to settle these matters completely. The literature then would not be cluttered up with reports of many surgeons of limited experience with only short time follow-up studies.

The "grass roots" surgeon is often at fault in adopting surgical procedures on the basis of preliminary reports and without adequate studies and follow-up reports. Many surgeons are quick to adopt any procedure on the basis that they are keeping up-to-date, keeping ahead of their competition, establishing a reputation for being modern, instead of adopting the wiser course and waiting until the new procedure can be evaluated properly in the light of more time and experience.

▼ Miscellaneous

Podiatric problems in dentistry

Earl L. Cherniak. *Massachusetts D.Soc.J.* 5:21 Jan. 1956

Although a dentist's life is greatly influenced by the condition of his feet, few dentists give proper care to their feet. Proper care and attention help insure a longer, more productive career.

The most common foot problems seen by the chiropodist are excrescences, corns and callouses. These hyperkeratotic lesions are symptoms of areas of pressure. Internal pressure is produced by deformed bones or a malposition of the bones of the feet. External pressure is usually caused by improperly fitted shoes or stockings. Reduction of the lesion gives relief. To insure more permanent relief, the cause must be found and eliminated.

The dentist's feet receive approximately ten times the wear and tear as do the feet of other members of the healing arts.

Congenital pes valgoplanus (flatfoot) is a normal asymptomatic condition that could remain

this way if left alone. Unfortunately, many instances are treated by the patient or shoe man. Acquired pes valgoplanus requires treatment. Each instance presents a different problem, visible often only through roentgenographic study.

To help maintain his feet in a healthy condition, the dentist must be particular as to the type and fit of footgear. The last of the shoe must conform to the shape of the foot. Overstrain of the foot and leg muscles must be prevented.

The feet should be rested periodically during the day, and, if possible, elevated. Men with peripheral vascular disease or diabetes should be especially careful of their feet. An astringent antiseptic powder should be used if the feet perspire excessively. A 5 to 10 per cent solution of Formalin can be dabbed on the feet daily, a treatment recommended for hyperhidrosis and bromhidrosis. Dry feet should be massaged with lanolin or cocoa butter. There are many good skin lotions that also can be used.

The visual problems of the dentist

Melvin Schrier. *New York J.Den.* 26:234-235 June-July 1956

Probably more than half the dentists now practicing are not visually equipped to do so. They may see well but they do not see comfortably over long periods.

Most dentists need near point correction for their work. Without it, they reduce their efficiency. The whole body may become overtired from overtired eye muscles.

The physical symptoms of visual disorders—headaches, double vision, blurring, conjunctivitis and squinting—do not necessarily indicate a need for corrective lenses. The dentist may have a simple muscular defect which can be cured through eye exercises. Every dentist, however, even the man with perfect vision, should protect his eyes with simple plane lenses as a precautionary measure against the danger of pieces of amalgam, chips of teeth, chips of filling and other debris hitting and possibly hurting the eye.

As the individual ages, his near point visual reserves decrease and he becomes more prone to eye fatigue and discomfort. At about the age of

35 to 40, the dentist usually needs bifocals for rapid adjustment from near to far point vision; at about the age of 65, trifocals are usually needed. Unfortunately, trifocals may not be practical for the dental task, so that the alternate solution is to get two pairs of bifocals, one to serve for work at the chair and the instrument table, the second for work at the desk and around the office.

Special visual aids, such as monocular or binocular loupes which fit over the regular glasses, have been adapted to solve the dentist's peculiar visual problems. With such loupes the dentist can easily make up the additional correction necessary for his near point work. Light softening lenses relieve the harsh glare of the usually brilliant lights under which the dentist must work.

Contact lenses should be considered for the dentist who is excessively nearsighted or farsighted. The newest contact lenses provide for long periods of comfortable vision.

Will dentistry accept the challenge?

John W. Geller. *J.Prost.Den.* 6:435-440 July 1956

The American dental profession has been challenged by M. M. House to establish a centralized educational dental museum. Representatives of the dental trades association, laboratory interests, manufacturers, educational institutions and dental organizations agree that such a museum is desirable.

A dental museum would preserve the work of such men as House, Gysi, Stansbery, Hall and McCollum. It would stimulate young men to enter the field of dentistry. A dental museum would interest and enlighten the general public. Contributions to dentistry made by the manufacturers and research men should be preserved.

Papers, photographs, equipment and other items have been promised should a dental museum be established. The museum might be located on a campus of one of the centrally located universities; one of the existing smaller dental museums might be expanded, or the Smithsonian Institution might be utilized as a dental museum. For years this institution has been acquiring many of the instruments and appliances mirroring the technologic development in dentistry. It has sev-

eral hundred U.S. Patent Office models from 1830 to 1880 relating to dental inventions. The Smithsonian Institution has recently received from Northwestern University Dental School the dental office equipment owned and used by G. V. Black.

The Academy of Denture Prosthetics, the American Denture Society, the Pacific Coast Society of Prosthodontists and *The Journal of Prosthetic Dentistry* have been seeking to establish a dental museum.

It is proposed that an organization be established representing all phases of dentistry, and that the various participating groups elect a 15 man board of directors which would proceed to establish such a museum.

That noise can be eliminated from dental office

E. S. Graybill. *J.Ontario D.A.* 33:17-18
July-Aug. 1956

Nowhere is a quiet, relaxed atmosphere more important than in a dentist's office, particularly in the operating and reception rooms. The one practical way to eliminate noises is acoustical treatment of the room. Some dentists attempt to mask noises and create a relaxed atmosphere with music, but this has its drawbacks; music that lulls one patient may set another's teeth on edge. The factor of reverberation that makes other extraneous sounds disturbing is likely to make the music seem unduly loud and blary and the commercials intolerably blatant.

It is the factor of reverberation that makes noise noisy. A dentist's operating room is a distressingly efficient echo chamber; the remedy is the introduction of more sound-absorptive surfaces. The most effective and least expensive way to do this is to cover a sizable area, such as the ceiling, with a suitable acoustical material.

A recent bulletin of the Acoustical Materials Association (of which the author is president) lists and describes 79 such products. The most common types are the familiar 12 by 12 inch tiles of perforated fiberboard or fissured mineral wool slab. These materials will absorb about 70 per cent of the sound waves that strike them. No one

type is "best" for any and all installations. Which one is best for a given location depends on such factors as the amount of sound absorption required, humidity and other atmospheric conditions, fire resistance, light reflection and how often the material will need to be cleaned and repainted. All the materials function in the same manner and owe their effectiveness to porosity. Sound waves, instead of bouncing off their surfaces, enter the material through the perforations or natural fissures and become enmeshed in the fibers inside, where they wear themselves out by friction. This stifles reverberation and reduces the general loudness of noise by 60 per cent or more. It does not reduce any noise at its source. The slam of a drawer or the clatter of the mechanical amalgamator will be just as loud as ever, but it won't sound as loud since there is no reverberation to amplify it. Even with windows open, traffic noises sound remote and subdued, since they no longer reverberate inside the room.

Acoustical material can be installed without major structural alterations in a room, usually without any alterations at all. The work can be done in a few hours, outside of regular office hours.

Policy statement on health insurance

J.Canad.D.A. 22:550-551 Sept. 1956

The Canadian Dental Association has issued a statement of policy relative to any health insurance plan that includes the provision of dental services. The statement embodies the following points, plus remarks on health education, dental research and treatment services:

1. The chief objective of the dental profession is to provide the best possible dental service for the people of Canada.
2. To this end the dental profession will co-operate with authorities in the formulation of plans designed to improve dental health.
3. The principle of contributory health insurance is approved. . . .
4. The patient must have freedom of choice

of dentist and the dentist must be free to choose patients. The personal relationship between patient and practitioner is essential to a successful health service.

5. Adequate training facilities of a high caliber are a necessity in order to supply a sufficient number of qualified graduates.

6. In order to sustain standards of practice, provision must be made for postgraduate education at frequent intervals.

7. As an essential part of health service provision must be made in hospitals for dental services.

8. The purpose of licensure to practice dentistry is primarily to protect the public. . . . All who desire to practice dentistry should be required to conform to uniformly high standards of preliminary education, and the subsequent training must include the basic sciences, technical and clinical subjects.

9. Under a health insurance plan all dental benefits should be made available including preventive, diagnostic and treatment services. Arrangements should be included for specialist and consultative services.

10. Methods of remuneration of dentists and rates of remuneration should be adopted only after agreement with representative organizations of the profession. The Canadian Dental Association is of the opinion that remuneration on the basis of fee for service results in a high quality of service.

11. Previous to the introduction of health insurance legislation, consultations should be held with the representatives of organized dentistry.

12. The administration of health insurance should be on national, provincial and municipal levels by independent, nonpolitical commissions, representative of those providing and receiving the services. Professional details should be determined by committees representative of the profession.

13. All dental appointees . . . should be selected only with the approval of the organizations representing the profession.

14. Dental benefits should be introduced in a gradual manner and after careful planning. . . .

Armamentarium



Equipment

New "Kolpofot" photographic apparatus for use in dental practice
(Die Verwendung des Kolpofotgerätes in der Zahnheilkunde)

W. Neuhäuser. *Deut.Stomat.* 6:32-33 Jan. 1956

Previously, dental photography has been confined mainly to dental schools, institutes or hospitals or to a few photographic hobbyists within the dental profession.

Recently, however, many dentists use photography in their practices, and the value of photographic records has become established.

A full utilization of dental photography as an integral part of dental practice is made by the introduction of the new German photographic apparatus "Kolpofot," which simplifies all procedures and reduces time and expense.

Experiments with this apparatus have proved that single lens reflex photographs can be taken at distances as close as 10 cm. from the object, and an accurate focusing and a composition free from parallax distortion are possible.

Pictures of occlusal conditions published in dental literature usually have been made with photoflash lamps. This method, however, does not assure correct illumination. In most of those pictures, only the anterior teeth are clearly observable. The new apparatus brings the posterior segments also to light.

The illustration shows the result obtained with the new photographic apparatus.

The patient's head has to be placed in a comfortable position. The curve of the lip, frequently distorted in dental photographs, should be turned

outside with two fingers. The apparatus can be placed close to the object. The bright, adjustable pilot light of the central photoflash lamp permits an adjustment at a diaphragm of from 1 to 45 cm. When the bulb is fired, the light is projected directly toward the object. The diffusion of light is especially desirable for taking color film exposures. The volume of light used is adequate for short distances, and is not uncomfortable to the patient. Direct positive and standard negative films can be used. This apparatus enables pictures to be taken with the patient in vertical or horizontal position. Neither blotting nor distortion caused by shaking is possible.

In the pictures taken with the Kolpofot apparatus, the posterior regions appear as clear as the anterior parts. The condition of all teeth from the left third molar to the right third molar can now be evaluated in the pictures and can be demonstrated to the patient.

Pictures with the most favorable contrast are obtained with 17:10 DIN isochromatic films be-



cause of their resistance to red color. In taking the picture, the recommended diaphragm is from 16 to 32 cm.

A simple and practical apparatus, permitting excellent dental photography, has been introduced. It is convenient and dependable, and will meet all the requirements of dental practice. The investment is moderate, and the exposure expenses minimal.

When the fundamentals of the photographic technic are mastered, only the correct focusing

of the lens, and the timely release of the shutter are required to produce excellent dental pictures.

The Kolpofot apparatus will aid in taking all types of dental pictures not only for the dentist's records but also for illustrations appearing in dental literature.



Materials

Symposium on acrylic resin filling materials

G. A. Morrant, Ivor R. H. Kramer and H. M. Pickard. *Proc.Roy.Soc.Med.* 49:375-379
June 1956

The acrylic filling materials, in spite of differences between individual brands, have basically the same structure as the original heat-cured acrylic denture resins. The defects and limitations inherent in the nature of methyl methacrylate have not been eliminated in the newer form of the materials. There is a volumetric contraction in the monomer on conversion to polymer. This means that, unless compensated, there is a potential contraction in the filling of about 6 per cent, which is only partially annulled by the subsequent expansion due to water absorption of 1.25 per cent. The material is soft in comparison with other filling materials and tooth structure, and is likely to wear under the forces of attrition and abrasion. Its high differential thermal expansion is over seven times greater than that of tooth structure.

Extensive investigations have shown (1) that all self-curing acrylic resins so far marketed probably are sufficiently irritating to require a lining wherever possible, (2) that oxyphosphate cement, although not free from irritating properties of its own, has proved a reasonably suitable lining material biologically, and (3) that freedom from symptoms after filling is no adequate indication of absence of significant pulp damage.

Probably the most satisfactory aspect of acrylic resin filling materials is their esthetic properties. When properly handled and uncontaminated, they can produce restorations which blend re-

markably well with the intact dental tissues. The low values in hardness, strength and stiffness preclude the use of acrylic resin in stress-bearing restorations. There is virtually no difference in the handling of acrylic resin and the silicate filling material, in terms of the technic of cavity preparation and the exclusion of moisture.

Acrylic resin at first appeared to represent a pronounced advance in restorative technic; in a modified form it may yet prove to be so, but so far it appears to be limited in its application, and to require a punctilious technic susceptible to unforeseen failure.

A material designed for frequent use by the practitioner should not make demands on his skill, time and application without some pronounced advantage to be gained in its use. Such an advantage cannot be claimed in support of self-curing acrylic resin used as a direct filling material.



Therapeutics

Use of trypsin intramuscularly as [a] prophylactic measure to control inflammation following root resection: a preliminary report

Samuel J. Paul and James Naplicic. *Oral Surg., Oral Med.&Oral Path.* 9:1015-1017 Sept. 1956

In this study the enzyme, trypsin, was used to prevent anticipated inflammatory reaction after root resection. The dosage used was 0.5 cc., representing 2.5 mg. of trypsin in sesame oil. The site of injection was either the deltoid or the gluteal muscle. A 1 cc. tuberculin syringe was used with a 22 gauge needle. The trypsin was given a half hour preoperatively, and the patients were premedicated routinely with 0.75 grain pentobarbital and 1/150 grain atropine sulfate. The control patients were premedicated but were not given trypsin intramuscularly.

Diminution of postoperative inflammation was observed in the 14 patients in whom trypsin was injected; no inflammation was observed in nine

patients, slight inflammation in three patients, and two patients showed a moderate amount of swelling of the lips and cheek.

In the four patients in whom trypsin was not injected, one patient showed slight inflammation, one showed a moderate amount of swelling and two had considerable swelling of the lips and cheek.

The unfavorable side reaction of trypsin was pain at the site of the injection in the majority of patients. This was not evident when the gluteal muscle was the site of injection.

The results indicate that trypsin is a valuable adjunct as a prophylactic measure in the control of inflammatory reactions after root resections.

Strontium chloride: its importance in caries prevention

(Chlorek struntu: jego znaczenie w zębolenictwie i profilaktyce)

Jadwiga Pawłowska. *Czas.stomat.* 9:353-361 July 1956

The staff of the Dental Institute of the University of Warsaw, Poland, recently investigated the semipermeable property of human enamel. These investigations led to later studies on the properties of protein bodies, the principal constituents of the cell protoplasm. In experiments based on the observations from these studies, several Polish authors have reported favorable results obtained with strontium chloride in strengthening dental tissue, and, therefore, in a possible prevention of caries.

Strontium chloride is a clear, colorless and crystalline substance; its chemical and physical properties resemble those of calcium preparations. With the use of topically applied strontium chloride, a quick and deep development of scar formation, especially in traumatic fractures, has been reported.

Strontium chloride possesses the ability of combining with the biocolloids of both the enamel and the dentin. This specific property of strontium chloride is best utilized in the form of a paste containing 75 per cent strontium chloride and glycerine, and in an aqueous solution containing 25 per cent strontium chloride.

The most favorable results were obtained in instances of hypersensitivity of dentin, caused by different factors, and in caries in which the enamel was underdeveloped. The topical application of strontium chloride changed the comparatively soft substances of the tooth surfaces into hard and smooth structures.

Re-examinations made with radioactive isotopes of strontium and calcium verified the reported favorable reactions.



Miscellaneous

Sterilization of endodontic instruments with gaseous formaldehyde (Eine Methode der Sterilisation mittels Formalindampf, unter besonderer Berücksichtigung der Bedürfnisse bei der Wurzelbehandlung)

M. Schug-Kösters, M. Wiegandt and R. Feistl. *Zahnärztl. Rundschau* 65:396-401 Aug. 20, 1956

Sterilization of dental instruments by boiling water or free-flowing steam, frequently used in dental practice, has the following disadvantages: (1) the boiling point of water is too low to destroy all microorganisms; (2) free-flowing steam does not reach all of the contaminated parts; (3) mineral deposits or stains may appear on the instruments, and (4) the edges of cutting instruments often become dull.

Sterilization with gaseous formaldehyde is relatively free from these disadvantages and is specially recommended for sterilization of endodontic instruments. By the use of gaseous formaldehyde, neither mineral deposits nor stains appear. It has no appreciable dulling effects on cutting edges. It is relatively inexpensive and readily available.

In order to test the efficacy of gaseous formaldehyde as a sterilizing agent for root canal instruments, several experiments were conducted by the staff of the conservative clinic of the Dental Institute of the University of Mainz, Germany.

Suspensions of the following microorganisms were prepared: *Staphylococcus aureus*, *Bacillus subtilis*, *B. globigii*, other unidentified types of

staphylococci and yeastlike microparasites obtained from infected root canals.

These suspensions were used to contaminate all types of endodontic instruments (made of different metals), cotton pellets and paper absorbent points. All these objects were handled with undisinfected fingers to secure another form of contamination.

After contamination, the instruments and implements were treated with gaseous formaldehyde, and tested after different periods.

It was established that gaseous formaldehyde prevents both the growth and the multiplication of the microorganisms used in these tests. Contaminated root canal instruments (even in whole sets), cotton pellets and paper absorbent points can be quickly and efficiently sterilized in gaseous formaldehyde.

In endodontic practice, therefore, it can be used for general sterilization as well as for re-sterilizing the instruments which have been contaminated during root canal treatment.

An improvement of the sterilization apparatus, at present in the experimental stage, will be reported at a later date.

Influence of different sterilization methods on the sharpness of dental instruments

(Der Einfluss verschiedener Sterilisationsarten auf die Schärfe ärztlicher Instrumente)

A. Kierse and H. Kierse. *Deut.zahnärztl.Zschr.* 11:436-439 April 15, 1956

In dental practice, the following methods for the sterilization of instruments are used: (1) cold sterilization with chemicals in either aqueous or gaseous form; (2) sterilization with boiling water with or without addition of chemicals; (3) sterilization with hot oils or silicone fluids; (4) sterili-

zation with superheated steam under pressure; (5) sterilization in autoclaves and (6) dry heat sterilization with or without air circulation.

Sterilization methods, to be useful for dental practice, must achieve the following: (1) quick and complete destruction of all microbial forms on instruments; (2) rendering the microorganisms incapable of fecundation and (3) quick re-use of sterilized instruments without danger of reinfection. There must be no danger of damage to the instruments, and the method must involve the lowest cost and easiest manipulation.

In cold sterilization, acids and alkalies are of little practical importance, because they are relatively inefficient bactericides. Various chemical solutions, although safe and practical for sterilization of instruments, do not destroy bacterial spores. These solutions, however, are adequate for sterilization of instruments which are not brought into direct contact with wounds.

Instruments which cannot be sterilized safely with compressed steam should be cleaned scrupulously and exposed to dry heat. A temperature of from 160° to 180° C. should be maintained for at least one hour. The dry heat apparatus requires simple manipulation, and the sterilized instruments appear clean and can be used immediately after dry heat sterilization. In many reports, however, it has been stated that dry heat sterilization dulls the instruments.

The damage inflicted on instruments by the different sterilization methods was investigated. A comparison of the results obtained revealed that the greatest dulling effect was caused by sterilization with boiling water because of visible and invisible rust formation. Less damage was caused by autoclaving. When instruments were sterilized by superheated pressure steam, the instruments actually became sharper, smooth and bright, and no stains of rust or corrosion were visible.

Prosthetic dentistry



Complete dentures

Esthetics and the denture base

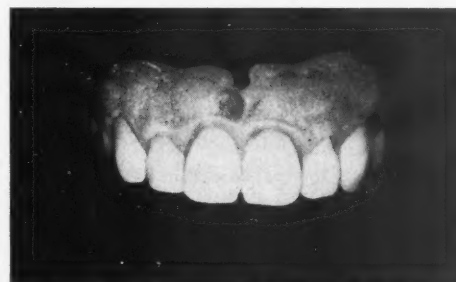
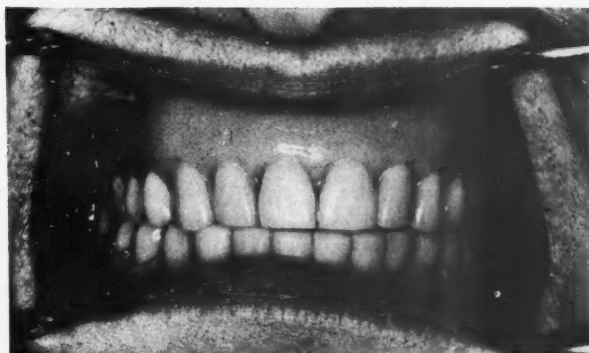
Donald F. Kemnitz. *J.Prost.Den.* 6:603-615
Sept. 1956

There is no excuse for dentures which can be classified as "false teeth" from appearance alone, yet a high percentage of dentures inserted today fall far short of restoring dental function and facial appearance.

The esthetic aim is the reproduction of anatomic characteristics present before the natural dentition is lost. Various factors are related to the denture base; a simple procedure can be used to produce an esthetic, natural appearing denture base which reproduces the contours of the tissue covered by the prosthesis, and which is stained to reproduce the natural tissue hues.

Natural denture bases are obtained by an esthetic wax-up which reproduces the contours of oral anatomy lost with extraction of teeth and alveolar resorption, and staining these contours to give them a vital appearance. One is of little value without the other.

The structures included in waxing the maxillary denture are as follows: The buccal and labial



*Completed dentures
with nonanatomic and anatomic bases;
on bench and inserted in mouth*

frenums, the gingival sulcus, the free gingiva or gingival margin (smooth surface), the attached gingiva (stippled surface), the interdental papillae, the root eminences and the attachment of the mucobuccal and labial folds on the facial surfaces. The incisive papilla, the rugae, the lingual margin proximal to posterior teeth and the contour in proximation with the anterior teeth are included on the lingual surfaces.

Excess wax is built up on all surfaces by softening small pieces of wax and pressing them into place or by rolling a wax sheet into a strip, heating and adapting it to the base. The facial surfaces are shaped first. The border is trimmed back to the thickness determined earlier on the cast. The gingival margin or free gingival limits are formed by the removal of wax from the cervical portion of the teeth until sufficient areas of their labial and buccal surfaces are exposed. More facial tooth structure is exposed in aged patients to represent the normal physiologic gingival recession. The interdental papillae are left long and pointed for young patients, increasingly short and blunt for older patients.

In staining the denture base to simulate natural tissue, three factors must be considered: (1) variations of color are affected by the extent of vascularity within the tissue; (2) the thickness and density of the soft tissues act as secondary factors in altering tissue hues, and (3) the cellular components of a tissue will alter its color.

Deep (red) tones are found in the mucobuccal fold, frenums, soft palate, pharyngeal soft tissue adjacent to the tuberosities, incisive papilla, interdental papillae and the larger rugae.

Pale (yellow) tones are found in root eminences and the hard palate.

Neutral (pink) tones which fall between the extremes of deep and pale tones are located on the lingual side of the lateral alveolar processes, and facially in the fan-shaped areas, between root eminences, that diverge toward the mucobuccal fold.

The time consumed in waxing and staining procedures is insignificant when the quality of the final product is considered. A denture that is difficult to detect when seen with natural mandibular teeth will do much to insure greater patient cooperation during the functional adjustment period.

Better prosthetics for the masses

F. W. Craddock. *New Zealand D.J.* 52:136-138
July 1956

The author answers the provocative article by A. Russell on "Prosthetics for the Masses" appearing in the same issue.

Russell's heavy reliance on gum tragacanth is unwise. Even if the powder could be applied in a uniform layer, the presence of a mass of jelly on the fitting surface of a base will make an accurate record of centric occlusion impossible. Allergy to gum tragacanth has been reported.

It is possible to train a technician to make shellac bases which in anatomic detail, freedom from distortion and accuracy of fit are almost indistinguishable from oil-resin paste impressions or finished dentures. They need no gum to hold them in place, and the patient does not leave the surgery with his tongue glued to the roof of his mouth.

Easing and adjustment of dentures are not to be regarded as welcome opportunities for enhancing the reputation or moral ascendancy of the dentist. Every postinsertion adjustment to a denture arises from an error of judgment or technic. Nothing increases the operator's confidence in himself and his methods more than the absence of any necessity for skillful easing.

Russell's figures for a rate of work remain staggering. Even when assisted by two nurses and five technicians, few practitioners could see 50 patients or complete 10 wearable dentures a day.

Hinge articulators are to be condemned because they do not permit milling-in with carborundum paste and thus bringing the teeth into efficient contact in centric occlusion. A good technician should not be handicapped by being restricted to a hinge articulator. Hinge articulators may aid in the production of locked and otherwise inefficient occlusions without the dentist being too painfully aware of what he is doing. Of course, if munching instead of chewing is good enough for the masses, there is little to debate.

It is doubtful if any dentist in New Zealand makes "Rolls Royce" dentures. If organized dentistry adopted the methods of mass production, merchandise having a superficial resemblance to

dentures would show a good profit at ten pounds the pair. Illegal practitioners, being beaten at their own game, would be starved out. Alternatively, the profession could decide to make "Rovers" at modest fees. [A Rover is an automobile of medium quality.] Their design and construction are quite beyond the talents of illegal practitioners. Yet "Rovers" are so evidently superior to "Fords" that the difference might be apparent to the masses as well as to the discriminating few—with similar results for the bootleggers.

Determination of vertical dimension by phonetics

Meyer M. Silverman. *J.Prost.Dent.* 6:465-471
June 1956

The patient's natural vertical dimension can be established accurately by the use of phonetics. The sibilant "s" of "yes" may be used in the measurement of vertical dimension; this is the most frequently used of the sibilants in speaking and reading, and it gives an accurate measurement for all patients.

The patient is directed to close the teeth into centric occlusion. The centric occlusion line is drawn on a lower anterior tooth at the horizontal level of the incisal edge of an upper incisor. This line serves as a reference.

The closest speaking line is then drawn on the same lower anterior tooth while the patient pronounces the "s" of "yes." The patient is directed to speak, or to read rapidly from a magazine, in order that the accuracy of the location of the closest speaking line may be checked.

The closest speaking space is the distance between the lower centric occlusion line and the upper closest speaking line. This space is the measurement for vertical dimension. The closest speaking space is not the freeway space. The freeway space is determined when the mandible and the muscles involved are at complete rest. The closest speaking space is determined when the mandible and the muscles involved are in phonetic action. The average freeway space measures 3 mm. The closest speaking space measures

from 0 to 10 mm. and must be determined exactly for each patient. It may require hours to determine the freeway space; the closest speaking space can be determined in seconds.



Palatal and facial prosthesis

Cooperation between prosthodontist and oncologist (A helyreállító protetika szerepe az onkológiai ellátásban)

Jenő Kertész. *Fogorv.szemle* 49:172-177
June 1956

Morphologic alterations and functional disturbances frequently remaining after successful surgical elimination of malignant tumors in the orofacial region exemplify the fact that dental prosthetics is of primary importance for the patient's rehabilitation physically and socially.

Although most of the techniques required are not beyond the skill of the dentist, it will be advisable to cooperate with a specialist (oncologist or surgeon). Such a cooperation will achieve the patient's complete recovery and his restoration to his previous capacity.

Most of the patients, handicapped by consequences of surgical elimination of malignant tumors in the orofacial region, have suffered severe facial distortions or functional disturbances in the oral cavity. These patients range from recluses to those who have achieved social adjustment to some degree.

In many instances involving facial defects caused by malignant tumors, the use of facial masks as a temporary measure will permit the patient at least a temporary esthetic rehabilitation until plastic surgery and prosthetic treatment are completed.

In all instances reported in medical and dental literature, favorable results have been achieved by cooperation between prosthodontist and oncologist, or between these specialists and the plastic surgeon.

Orthodontics and pedodontics



Orthodontics

Orthodontic treatment: its initiation and termination (La ortodoncia. Como empezarla y como terminarla)

Pedro Planas Casanovas. *Rev.españ.estomat.*
4:225-232 May-June 1956

Diagnosis and prognosis are of the foremost importance in orthodontics. Only when this fact is realized will good appliances be invented. Unfortunately, too often appliances are understood, and the value of diagnosis and prognosis is ignored.

"Orthodontics is that part of medicine that studies the etiology and genesis of functional and morphologic anomalies of the face, and has as its goal their prophylaxis, diagnosis and treatment."

Teeth do not appear in this definition. The prime objective is the face and its skeleton, the maxilla and the mandible. Only then the teeth, as contained in these bones, are considered.

This definition destroys most orthodontic classifications which are symptomatic. Angle's classification, based on the eruption of the first permanent molar, considers only a symptom and does not give a diagnosis that will lead to a prognosis and treatment. A symptom is not a diagnosis. To say that a patient has a temperature of 130° F. means nothing therapeutically, as many diseases provoke fever.

A genetic classification is the only one that should be used.

Biologically there are three types whose peculiarities are caused by the predominance of each of the three blastodermic layers. For example, in the mesoblastic type there is a predominance of the muscles, bones, heart, kidneys and gonads. In this type it is unusual to find that a person who breathes through the mouth has distocclusion, or protrusion of the incisor teeth.

To this biologic approach must be added the possible racial variations; for example, what is

normal in an Aryan is not so in a Mongol or an African.

The objective in orthodontic treatment is to obtain functional and esthetic normality of the face and its skeleton, and this is usually accompanied by a perfect and harmonious relation between upper and lower dental arches. First is the functional normality, and this almost always brings about the esthetic normality to the face. If the aim is not the establishment of a balanced occlusion, then all that is accomplished is to convert an esthetic impairment into a functional disorder, which is more harmful.

Results can be obtained by several means: functional, biomechanical (which employs activated plates) and mechanical (by fixed appliances).

Functional treatment is that which utilizes the power of the facial and cranial muscles as the only force, and is the only method that always produces a balanced occlusion. Functional treatment also assures esthetic results, because all muscles are stimulated and strengthened, thus leading to harmony in the soft tissues of the face.

The present state of orthodontics in Europe (O estado actual da ortodoncia na Europa)

Costa del Rio. *J.estomat.,Lisbon* 3:5-10
Feb.-March 1956

Since World War II, orthodontics in Western Europe has become more vigorous than before.

When, in 1899, Angle presented his method of diagnosis based on the occlusal relations of the first permanent molars, a new era opened up for orthodontics. Until then the criterion had been the esthetics of the incisor teeth. Angle had numerous disciples, including many in Europe.

The limitations of Angle's method were combatted principally in Europe. This explains why, in 1920, Paul W. Simon presented his cephalometric diagnosis by means of an instrument called a gnathostat. Although the gnathostat is partly abandoned today, it is useful when the changes that teeth undergo through orthodontic treatment are to be verified.

Oriented photography, taken in certain definite and fixed planes, is a diagnostic aid which also

permits the operator and parents to appreciate the esthetic progress of the patient.

Dentofacial anomalies can be diagnosed by cephalometric teleroentgenography better than by any other method. It shows the relationships between cranial structures, the position of the teeth, and outlines the soft tissues. This method has not become popular because it demands more powerful and more costly x-ray machines than the dentist usually has in his office.

Currently the method of etiologic diagnosis is becoming more prevalent in Europe. On the basis of scientific medical facts, it groups anomalies of dental position into orthodontic diseases. The different symptoms evident in these orthodontic diseases are brought about by identical or similar disturbances, according to Kantorowicz, Korkhaus and A. M. Schwarz. Research has established at what period of development the anomalies are caused by these disturbances, which may be hereditary or acquired.

Most orthodontists utilize the etiologic or genetic diagnosis to study dentofacial anomalies. Among the means used are the following: a detailed history that brings out every possible factor, hereditary or acquired, that may disturb growth; a study of the casts oriented on the sagittal, vertical and transversal planes; an examination of full face and profile photographs, and a study of intraoral and teleroentgenograms. All these give an orthodontic syndrome, and permit the dentist to plan treatment with a minimum risk of recurrence of the anomalies corrected.

After Angle simplified his appliance it became very popular, and is still used by many operators. The ribbon arch and edgewise appliances were developed in America. This mechanical era also flourished in Europe, but was gradually abandoned as Schwarz's research showed that mechanical action should not exceed the vital limit of the periodontal cells. First, Angle's arches were made thinner, with weaker springs. Today the tendency is to use appliances that in themselves are static and do not exert any force of their own, but function so that teeth and maxilla and mandible are directed to their correct positions. A classic example is Hawley's retention plate with an inclined plane which remains static in the mouth; when the patient bites, his lower incisors occlude on the inclined plane and slide forward.

Thus the mandible advances from distoclusion to normal occlusion, and the masticatory muscles are gradually adapted to this normal position.

Many feel that Andresen is the creator of functional orthopedics, but Robin presented this method in 1902. Nord's studies, supplemented by Schwarz's work and publications, increased the popularity of rubber plates as orthodontic appliances, because they made this type of treatment accessible to many more dentists and many more patients.

Lately Hugo Bimler created a new technic that employs dynamic functional forces. The appliances remain passive in the mouth and avail themselves of the force developed by the masticatory muscles. Their action is intermittent, and only takes place during deglutition or on passing from active to passive occlusion.



Growth and development

Basic etiological factors in dentofacial malformations

J. A. Salzmann. *Am.J.Orthodont.* 42:702-704
Sept. 1956

The three stages in the manifestation of the growth pattern are (1) genotypical, (2) fetal environmental and (3) postnatal environmental. Whereas the genotype determines whether a total malformation will be present, environment (in addition to being responsible for malformations) determines the severity with which malformations of genetic origin will manifest themselves.

Among the intrauterine environmental factors responsible for congenital malformations are vitamin deficiency, riboflavin deficiency (which has been found to result in shortening of the mandible, cleft palate and other skeletal malformations in rats) and the lack of certain trace elements in food.

Radiation is a known cause of deformity in newborn children. Animal experiments indicate that malformed newborn offspring can be produced by a dose as low as 25 roentgens.

Endocrine imbalances cause disturbances in the growth and development pattern. Large doses of hormones given to pregnant rats produce cleft palate and other malformations.

Rubella in pregnant women has been found to be an important factor in causing malformation in the fetus.

Since malformations can be produced in the fetus by unfavorable environmental conditions, malformations should be obviated by favorably influencing fetal environment. How this can be accomplished requires research.

Greater knowledge and understanding of etiology are important to the successful treatment and in the prevention of maxillofacial deformities.



Pedodontics

Thumb-sucking

Kathryn L. Hagen. *Life & Health* 71:15, 27
Nov. 1956

A normal baby is born with four feeding reflexes—rooting, sucking, swallowing and satiety. The sucking desire remains strong for varying lengths of time, but ordinarily diminishes toward the end of the first year. The mouth, which is the infant's source of first recognized pleasure, remains a source of pleasure to him throughout life.

Thumbsucking has caused undue worry, and all kinds of devices have been used to stop thumbsucking. Some sound cruel in the light of present information. Thumbsucking may displace the teeth, and the thumb may become calloused or even infected; there are no other known harmful effects. Thumbsucking does not cause deformity of the jaw, infections, or stomach or intestinal diseases. Babies who do not suck their thumbs swallow as much air as those who do. Both thumbsucking and masturbation are habitual manipulations of the body, nothing more. There is no more tendency for a thumbsucker to masturbate later in life than for a nonthumbsucker.

Ruth and Bakwin report: "Thumbsucking can

displace teeth, but it does not seem to affect the molar relationship. Although it may affect children with an underlying poor bite, it has little or no significance in children who have good bites."

During the eruption of the deciduous teeth, the urge to bite is physiological and part of the oral development. It should not be interfered with. Children can be helped to stop thumbsucking when they are physiologically and psychologically ready. Parental influence may result in entrenching thumbsucking. The infant who sucks his thumb during the day after his first or second year of life is probably overtired, unhappy or bored. Nervousness, excitability or a tense personality in the mother may need correction for the child's sake.

Thumbsucking can be corrected

William N. Flesher. *J. Oklahoma D.A.* 45:11-12
Oct. 1956

If a child wishes to stop the habit of thumbsucking, success is almost certain. Two case histories are reported to demonstrate the technic used by the author.

The dentist asks the child if she wishes to stop her habit. If the answer is affirmative, simple instructions are given. The parent is instructed to buy a particular bitter tasting prescription. The patient puts this on the thumb to act as a reminder, not as a punishment. The child calls the following day to report progress. The habit is discussed openly and simply. This procedure is repeated until the habit is broken.

Of 40 patients for whom accurate records are available, 30 stopped the thumbsucking habit in from one to three days after the initial appointment; 9 patients required up to four weeks, and 1 did not want to stop the habit. Most success has been obtained with patients from seven to nine years old; a thumbsucking habit, however, should be broken before this age if possible. Before the age of four or five a child may have difficulty in comprehending the plan of treatment.

The thumbsucking habit can be broken without the use of orthodontic appliances. After the habit is stopped, the normal function of the lips can cause the teeth to assume a better alignment.

Preventive and public health dentistry



Caries etiology and control

Inefficient dental procedures:

a cause of caries

(Ein Beitrag zum Kariesproblem)

Hans Weber. *Deut.Stomat.* 6:408-414 July 1956

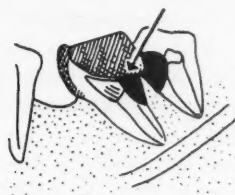
The dentist's daily work, especially if the waiting room is crowded, consists mainly of extractions, fillings and prosthetic services which are performed and then repeated again and again. This repetitious routine may easily lead to fatigue, and, therefore, to a decline in the quality of the dentist's work. The dentist must fight continually against such a possible deterioration in his professional standards, because trauma and faulty dentures may promote caries.

Whatever the view of caries etiology may be, several causes of caries development have to be considered.

Wannemacher classifies the causative factors of caries as follows: (1) hereditary transmission of caries or hereditary susceptibility to caries; (2) dietary factors; (3) contagious diseases; (4) endocrine factors, and (5) trauma.

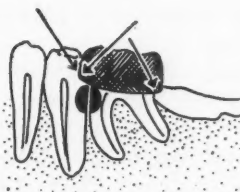
After completion of tooth development and eruption of the deciduous and permanent dentition, the following causative factors can be added: (1) malposition of teeth; (2) secondary displacement of otherwise intact teeth; (3) mechanical influences; (4) changes in the framework of the body; (5) influences of the saliva on tooth structures; (6) enzymatic action; (7) bacterial invasion; (8) changes in the basal metabolism, and (9) changes in tooth function and masticatory habits.

Under the classifications, "trauma" and "mechanical influences," however, dental procedures, or more clearly formulated, the construction and

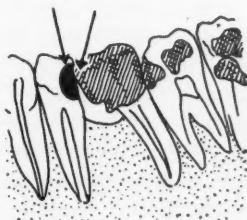
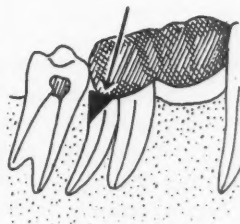


Faulty proximal filling causes development of carious lesions

Overhanging crown margins form a pocket in which food particles accumulate

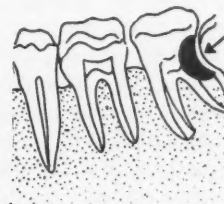


Poorly executed instrumentation in cavity preparation causes the formation of a retention spot (shoulder)



An improper free-end crown attachment leads to caries development in an adjacent tooth

Constant pressure exerted by a tilted third molar causes development of carious lesions in the second molar



insertion of faulty partial dentures, may be added. The procedures which may promote caries range from simple fillings and inlays to partial dentures, and from crowns and bridges to fixed and removable complete dentures.

Faulty proximal fillings frequently cause secondary caries in the treated or the adjacent teeth. During cavity preparation, injuries to tooth structures often occur by poor manipulation of instruments and may remain unnoticed. Filling material sometimes is pressed into the interdental space and remains attached to the neighboring teeth, forming retention spots in which caries later develops. Parts of cement fillings also are often pressed into the interdental space by masticatory action, causing an irritative defect which seldom occurs when amalgam fillings are used. That secondary caries occurs subsequent to faulty fillings, the busy dentist can observe every day.

In crown and bridge construction, the lack of adequate occlusion is one of the most frequent blunders. Superficial preparation may expose the dentinal canals. Crowns not properly attached to neighboring teeth may cause secondary caries. In instances in which such an attachment is necessary, it should be connected to an inlay in the adjacent tooth.

Because caries frequently develops in the still eruptive dentition, space maintenance in the deciduous dentition is important to avoid subsequent crowding in the permanent dentition.

Tilted teeth which press constantly against other teeth also create retention spots in which food particles accumulate. Immediate correction is essential.

Patients with carious lesions on the neck of almost every tooth are either juveniles of the asthenic type or pregnant women; both groups are especially susceptible to caries.

In addition to clinical and roentgenographic examinations, it is advisable to determine and record the general health condition of each patient as well as all existing conditions in the oral cavity. It should be routine practice for the dentist to classify patients with regard to resistance or susceptibility to caries. During subsequent periodic examinations, it is also desirable to make a detailed study of the condition of fillings, inlays, crowns, bridges and partial dentures from the standpoint of caries.

To be honest with his patients, the dentist must be honest with himself. If his prosthetic work shows signs of inadequacy, immediate correction should be undertaken without hesitation. If the dentist is successful in recognizing and locating the cause of failure, he will be a better dentist.

Effect of fluorides and other solutions on solubility of powdered enamel in acid

Joseph C. Muhler. *Proc. Soc. Exper. Biol. & Med.* 92:849-851 Aug.-Sept. 1956

The solubility of powdered human tooth enamel was measured after treatment with stannous fluoride, sodium fluoride, sodium N-palmitoyl sarcosinate, sodium dehydroacetate and sodium oxalate, by a method which measures the amount of phosphorus dissolved from the treated enamel by acetic acid.

Stannous fluoride was by far the most effective compound tested; a 1 per cent solution reduced enamel solubility by 86 per cent, and a 0.1 per cent solution was 85 per cent effective. Sodium fluoride reduced enamel solubility by 44 per cent and 36 per cent, respectively. The sodium N-palmitoyl sarcosinate was only moderately active, a 1.0 per cent solution reducing the solubility of the powdered enamel by only 20 per cent and a 0.1 per cent solution by only 4 per cent. Sodium dehydroacetate and sodium oxalate were without effect in decreasing the solubility of powdered enamel.

Enamel uptake of fluorine from topical application

Benedict B. Kimmelman and William C. Foster. *Pennsylvania D.J.* 23:12-16 Feb. 1956

Favorable clinical results in caries control from topical applications of sodium fluoride to deciduous and young permanent teeth have been reported with the "Bibby method" (a single seven to ten minute application every four months) and the "Knutson method" (four closely spaced applications of three to four minutes each).

In situ studies were undertaken to determine the fluorine content of enamel after a single ap-

plication of fluoride. The fluorine preparations tested were 2 per cent aqueous sodium fluoride; 4 per cent aqueous sodium fluoride; 0.95 per cent sodium silicofluoride, and a commercial sodium fluoride cream consisting of 2 per cent aqueous sodium fluoride, 2 per cent titanium oxide, 0.3 per cent sodium lauryl sulfoacetate as a wetting agent, glycerine, thymol and menthol.

The first part of the study was carried out on 12 intact first bicuspid requiring extraction for orthodontic therapy; each treated tooth was matched against its own untreated homologue. The second part of the study compared treated and untreated surfaces of 11 additional teeth.

Duration of applications varied from 5 to 12 minutes. The results were tabulated.

Previous observations that fluorine content of sound enamel ranges widely were further substantiated. The range in this study was from a low of 0.004 per cent to a high of 0.022 per cent.

Each treated tooth and surface in the young patients showed a higher enamel fluorine content than its control, and the differences were significantly greater than any found in untreated pairs.

A single careful sodium fluoride application to cleaned intact young teeth in the mouth adds fluorine to their enamel.

Proteolytic saliva tests

(Der proteolytische Speicheltest)

Florian Prader. *Schweiz. Mschr. Zahnk.*
66:751-754 Aug. 1956

Evaluation of proteolytic action in human saliva is important in caries research. Dental enamel often is covered with films in which proximal caries begins. The course of carious processes follows the route of organic enamel lamellas. The problem of hydrolysis of proteins into proteoses, peptones and other protein products through enzymatic action is in the foreground of recent caries research.

In addition to localized attacks on organic substances of hard dental structures, an alimentary proteolysis takes place in the oral cavity. Decalcification of enamel by acid action is caused by apatite crystallites resulting from carbohydrate metabolism.

The first test method demonstrates proteolytic actions of human saliva on gelatin. The gelatin of x-ray films is indissoluble in water. Human saliva in different dilutions was applied on exposed x-ray films and photographic plates. This method permits an examination of catalytic actions of each enzyme separately and especially those of gelatinase and of substances which interfere with the enzymatic system.

The second test method determines the ptyalin action on plates consisting of pure blood fibrin and protein.

After these plates are stained, pictures can be taken without a camera. In the darkroom, the plates are put on unexposed paper, exposed for from one to three seconds, and developed.

Both test methods, together with a lactobacillus count, will be useful and reliable for studies on the proteolysis in the oral cavity for future caries research.

The possible caries activating effect of chemical reactions between sucrose and ferric iron

Per Torell. *Odont. Tskr.* 65:165-183
June 1956

Experimental studies (1953) showed that sucrose strongly combines with ferric iron in neutral solutions. Hence it seems probable that ferric compounds precipitated on the surface of dental enamel can adsorb sucrose, with a possible consequence that a subsequent decomposition of sucrose makes the surface vulnerable to dental caries. Such a mechanism appears to be of special significance in persons imbibing iron medicine or iron-bearing drinking waters.

In the present investigation the chemical behavior of sucrose toward ferric hydroxide-ferric phosphate gels was examined. The investigation utilized a method based on the rate of diffusion of radioactive phosphate ions through such gels in the pH range of 6 to 7.5. The results indicate that sucrose is bound chemically to ferric hydroxide-ferric phosphate gels between pH 6.5 and 7.5 if the gels have been precipitated in phosphate buffer solutions at the corresponding pH value. At pH 6.0, however, sucrose was bound to gels precipitated at pH 7.5.

The experiments indicate that sucrose is chiefly bound to ferric hydroxide. Diffusion experiments performed with precipitates between saliva and ferric chloride showed that ferric iron combines with salivary components probably of organic character. This combination has a retarding effect on the fixation of phosphate ions. At pH 6.0 the bonds between the salivary components and ferric iron are released, thus permitting the binding of phosphate ions or sucrose. In the presence of sucrose and phosphate ions, sucrose is preferentially bound to the precipitate.

The following deductions can be made concerning the intake of ferric iron and sugars. Iron medicines and iron-bearing waters may establish a layer of ferric hydroxide-ferric phosphate gel precipitated at the enamel surface of the teeth. A subsequent intake of sucrose brings about a decrease in the pH value, thus releasing the bonds between iron and salivary components. Consequently, sucrose molecules can be bound to the ferric iron. As these molecules are decomposed, a further drop of pH is initiated, and the ferric iron free of sucrose is capable of binding phosphate ions. This ought to facilitate the dissolution of enamel apatites.

This mechanism seems to have a special bearing in the promotion of dental caries on the smooth surfaces. It can be concluded that the intake of iron compounds ought to activate caries, especially with individuals who frequently consume sugar-containing foodstuffs.

The rate of flow of stimulated saliva in high and low fluoride areas

G. Neil Jenkins. *Brit.D.J.* 101:79-80
Aug. 7, 1956

Bishop, Richardson and Muhler (1955) showed that the injection into anesthetized dogs of various fluoride solutions providing up to 2 mg. of fluoride ion caused a peripheral vasodilation. They suggested that the beneficial effect of fluoride on caries might be brought about by increasing the rate of salivary secretion following an increased blood flow through the glands.

A number of workers have shown that the average rate of flow of saliva tends to be greater

among subjects relatively free from caries than in those with a high caries activity. There are, therefore, grounds for expecting that any factor which increases the rate of salivary flow would tend to reduce caries.

The rates of flow of wax-stimulated saliva were compared in classes of about 40 children each, of the same sex and similar in age, in towns with high and low proportions of fluoride in the water. The rate of flow of wax-stimulated saliva was higher in the "low fluoride" town. This fact is contrary to what would be expected if the hypothesis of Bishop and others were correct. The average rate of flow in the "low fluoride" town was 7.90 ml. in five minutes of chewing; in the "high fluoride" town it was 6.70 ml. The results do not support the suggestion that fluoride may exert its anti-caries effect by increasing the rate of saliva secretion.

Caries prevention by fluoridation of drinking water in Japan

(Kariesprophylaxe durch
Trinkwasserfluoridierung in Japan)

Gen Minoguchi, Kyoto, Japan. *Quintessenz* 7:794
Aug. 1956

In Japan, during 1947, preliminary investigations of caries frequency were made in 279 communities which had a comparatively high fluoride content in the drinking water. About 24,000 inhabitants were examined. The results obtained left no doubt that the large and possibly rising incidence of caries in Japan presents a medical and dental problem of primary concern.

Based on the results of these investigations, the drinking water of the section Yamashina of the city of Kyoto was fluoridated artificially with 0.6 ppm fluoride. Fluoridation was introduced in Yamashina in 1952, and 20,000 persons now receive fluoridated water.

Since then, the 1,108 school children of Yamashina have been examined periodically by dentists and physicians to determine whether essential changes in caries frequency or in general health condition have taken place.

Simultaneously, as a control, the 1,099 school children of Shugakuin, another section of Kyoto, have been examined periodically. The drinking

water of Shugakuin was not fluoridated, and it contains very little natural fluorine.

The results of these periodic examinations, carried out between 1952 and 1955, are as follows:

1. New caries incidence in children of the age group 10 to 14 years: in Yamashina, 151 teeth in 100 children; in Shugakui, 194 teeth in 100 children.

2. New caries incidence in children of the age group under 10 years: in Yamashina, 119 teeth in 100 children; in Shugakui, 187 teeth in 100 children.

3. New carious lesions in first molars in children now seven years old (they were three years old when fluoridation in Yamashina had started): in Yamashina, 77 teeth in 100 children; in Shugakui, 124 teeth in 100 children.

In children between 3 and 4 years old, the decrease in caries incidence in Yamashina is about 50 per cent when compared with Shugakui. Teeth with completely developed crowns showed a significant strengthening of the resistance to caries after fluoridation. No instance of mottled enamel was observed.

Roentgenographic examinations revealed no abnormalities in development of permanent teeth, in natural absorption of the roots of deciduous teeth or in normal eruption. No unfavorable secondary effects of fluoridated water, either in the installation of the waterworks of Yamashina or of that of other industrial plants (breweries, artificial ice manufacturies and chemical industries) were observed.

The mechanism of dental caries

(Le mecanism de la carie dentaire)

Ch. Leimgruber. *Rev.mens.suisse odont.*
66:934-963 Oct. 1956

Cavitation in the hard tissues of the teeth is considerably favored by a biologic factor inherent in tooth structures. Little is known, however, about the characteristics of this important factor.

This dynamic and substantial factor determines the permeability of the hard tissues by the cavity-forming substances such as acids, bacteria and enzymes.

The physical condition of the tooth colloid de-

termines immediately the permeability (low resistance) or the impermeability (high resistance) of the hard tooth tissues to the cavity-forming agents.

If the tooth colloid is in a sol condition, the tooth is highly susceptible to caries, and the cavity-forming substances can diffuse into the tooth structures without resistance. If the tooth colloid is in a gel condition, however, the tooth is and remains resistant to caries.

Physiologic and pathologic conditions of the tooth colloid can be determined by establishment of the presence of ions in the saliva. Susceptibility to caries can be determined by the prevalence of carbon-nitrogen-sulfur and sodium ions (sol condition). Resistance to caries is determined by the predominance of phosphorus-oxygen, calcium or potassium ions (gel condition).

Effective prevention of caries, therefore, is possible only by enriching the human saliva with the essential caries-prohibiting ions.

Salivary lactobacillus counts and Snyder's caries susceptibility test, and their relationship to dental caries incidence during a period of 12 months

Geoffrey L. Slack and W. J. Martin. *Brit.D.J.*
101:111-115 Aug. 21, 1956

A group of children in a residential home were examined and saliva specimens collected at intervals during one and a half to two years. Lactobacillus counts and Snyder's colorimetric tests for caries susceptibility were carried out to determine the relationship of these tests to dental caries occurring during the period. In the main part of the inquiry 84 children with 1,648 permanent teeth were observed for one year.

There was no definite association between the lactobacillus counts or Snyder's tests and the development of caries in the following 6 to 12 months. On the basis of the tests it was not possible to forecast the incidence of dental caries.

It is generally agreed that the microorganisms of the dental plaque are those intimately concerned with the caries process. The assumption that stimulated saliva contains microorganisms

which by their numbers and biochemical behavior will indicate the caries activity on the tooth surface seems difficult to support. It is unlikely that the microorganisms in saliva represent a true sample of those in the plaque. Further research is needed to assess the relationship between the bacterial populations in the saliva and the dental plaque.

Experimental studies of dental caries.

1. The relation of bacterial invasion to softening of the dentine

Alexander MacGregor, Edward A. Marsland and Isabel Batty. *Brit.D.J.* 101:230-235 Oct. 2, 1956

Whether softening of the dentin precedes the invasion of organisms once the enamel has been breached, or whether organisms are present in the dentin in advance of this softening, remains a disputed point, although much research has been done on the subject.

All teeth extracted in the general anesthetic department of the Birmingham Dental Hospital were placed in sterile bottles, sorted, and those with cavities sufficiently large for the dentin to be well involved but not so large that previous death or exposure of the pulp seemed probable were selected. Within five hours of the extraction, cavity preparation was undertaken. With a slow running handpiece and a sterile tungsten carbide bur the cavity was opened and enlarged to give easy access to the carious dentin. The softened dentin was carefully removed with sterile excavators. After superficial softened dentin had been removed, samples of the deeper softened dentin were removed and inoculated for incubation. These samples were used as a control to check that viable organisms were present in the softened dentin.

All softened dentin was finally cleared from the cavity. If the floor was found to be firm, scrapings were taken and this material was incubated.

After the bacteriologic work had been completed, the tooth was placed in a numbered bottle of formaldehyde saline for later decalcification and sectioning.

One hundred teeth have been examined in the

manner described. Although there is not complete correlation between the bacteriologic and histologic findings, this correlation exists in 62 per cent of the teeth examined. Positive cultures were obtained from the softened dentin before its complete removal in every tooth; the possibility of negative cultures being due to the nonviability of organisms in the softened dentin, or immediately below it, can therefore be dismissed.

Scrapings from the hard dentin after removal of the softened portion above were bacteriologically sterile in 49 per cent. Histologically, 61 per cent showed no organisms at all in the dentin beneath the cavity after removal of the soft caries with excavators; 21 per cent were seen to have between 1 and 20 tubules below the cavity containing organisms, and 18 per cent showed 20 or more tubules containing organisms. The conclusion must be drawn that at least in the majority of carious cavities, softening of the dentin must precede the organisms presumably responsible for it.

The implications from this conclusion are important. From the clinical viewpoint it would appear that methods aimed at disinfecting the cavity after removal of softened dentin may be unnecessary if this softened dentin be removed completely.

Urinary fluoride levels associated with use of fluoridated waters

I. Zipkin, R. C. Likins, F. J. McClure and A. C. Steere. *Pub. Health Rep.* 71:767-772 Aug. 1956

The study was undertaken to provide the following information with respect to fluoridated drinking waters: (1) the relation between the level of fluoride in the drinking water and the concentration of fluoride in the urine; (2) the time required after fluoridation for this relation to become stabilized, and (3) the effect of the age of the individual on the time required for establishment of this equilibrium.

The concentration of fluoride in the urine was determined in individuals of different ages who were drinking water fluoridated to about 1.0 ppm fluoride with sodium silicofluoride (Montgomery

County, Md.) or with sodium fluoride (Grand Rapids, Mich.).

In adults (Montgomery County), the water fluoride and urinary fluoride concentrations became about equal within one week after the introduction of the fluoridated water. In school children aged 5 through 14 years (Montgomery County) and 6 through 17 years (Grand Rapids), a considerably longer period of time (about three and five years respectively) elapsed before the concentration of fluoride in the urine reached that in the drinking water.

The difference in the response of adults and children during the initial period of exposure to a fluoridated drinking water suggests that the maturity of human skeletal tissue influences its capacity to retain fluoride.

The results of this study do not suggest any essential difference in urinary elimination of fluoride ingested in naturally fluoridated drinking water and the elimination of fluoride ingested in drinking water fluoridated with either sodium fluoride or sodium silicofluoride.

The findings are regarded as evidence that no hazard of cumulative toxic fluorosis is associated with the use of a drinking water containing 1 ppm fluoride.

Action of saliva in the production of dental caries (Rol de la saliva en la produccion de la caries dental)

Ana Ochoa B. *Rev.odont., Paraguay* 2:9-17
Feb.-April 1956

The factors which contribute to dental caries constitute an unsolved problem. Toothbrushing has not eliminated decay, nor has a controlled diet.

The saliva is an organic fluid which contains active ingredients, some of which are enzymes. This may partially explain why certain families are prone to dental decay, and others are not.

A person with rampant caries usually has saliva that hydrolyzes starches rapidly, with quick fading of the blue or brown color of an iodine solution. A child with multiple caries has a shortened hydrolysis rate, whereas the saliva in a caries-immune child breaks down the starches slowly.

The saliva from the parotid gland has a faster hydrolysis rate than the sublingual and submaxillary fluids.

As for saliva pH, immunity to decay is associated with low acidity and high alkalinity, whereas in children with multiple caries, high acidity and low alkalinity is found. But the alkaline reserve of the saliva has a more direct bearing on caries than the acidity or the pH. Thus it would appear that immunity is related to greater basic reserve, or an enzyme system which permits establishment of such a reserve.

A factor more effective than alkalinity is the content and production of quinone in the saliva. Its content is high in caries-immune children, and constitutes a valuable aid in the prognosis of caries production, arrest or immunity.

It is interesting that tryptophan, an amino acid, retards the hydrolysis rate of starches, and also increases the production of quinone. It is possible that its intake would improve dental conditions.

The problem of dental caries (Le problème des caries dentaires)

Bertrand Kerébel. *Actual.odontostomat.,Paris*
33:93-100 March 1956

The problem of dental caries cannot be solved until the mechanism of the disease is explored thoroughly. The most important factors in the caries mechanism are decalcification and proteolysis. Neither, however, is the exclusive cause of caries.

Decalcification, the process of morbid softening of tooth structures, occurs first in the interprismatic substances, and is followed in the parts of the prisms that unite the individual calcospherites. This phenomenon also is called transverse striation, because the segmentation of each prism is indicated by dark lines running at right angles to the rods. Decalcification can hardly be called caries, although some loss of inorganic salts seems to have taken place.

Although proteolysis, the hydrolysis of protein into proteoses, peptones and other compounds by enzymic action changes tooth structures, it cannot be considered as being a significant causative factor in the carious process. Even the dis-

covery of proteolytic bacteria will not solve the problem.

Systematically, the cause of caries should be sought rather in (1) the presence of cariogenic microorganisms; (2) the cariogenic effects of certain foodstuffs, and (3) the caries susceptibility of individual structures of the mouth and the teeth.

The actions of these microbic and nutritional factors, however, can be more effectively investigated in animals than in man.

Further research has to determine the still unknown factors of the caries problem such as elective localization, biochemical properties of dental tissues involved from their origin to maturity, and the degree of their catabolic metabolism.

Therefore, at least for the present, because of lack of significant data available, the problem of caries seems to be insoluble.



Nutrition

Diet and nutrition in relation to teeth: the problem of misconceptions

R. K. Logan. *School D. Serv. Gaz., New Zealand*
16:42-43 July 1956

One of the functions of the health educator is to dispel false ideas that constitute obstacles to the attainment of health, and to substitute others supported by scientific evidence.

Many laymen adhere to the misconception that agricultural products, both animal and vegetable, grown in quantity with the aid of chemical fertilizers, are necessarily inferior to the assumed "natural foods" grown in ground enriched only by the so-called organic fertilizers. This error is based on a misunderstanding of the chemical nature of foodstuffs and of body processes, coupled

with a failure to appreciate the chemist's capacity for extraction and synthesis. Soils in their natural condition untouched by man frequently are deficient in essential elements, in which instance plant deficiencies may occur. Soil phenomena that adversely affect plant and animal life occur naturally and frequently and require adjustment by the chemist.

Although food processing technics change the essential characteristics of food, sometimes with a resultant loss in nutrients, it is absurd to assume that modern urban civilization could survive on the produce of the land as the produce develops seasonally and appears naturally on the markets. Modern scientific knowledge enables the chemist to determine the loss sustained in food processing, and to add laboratory products to compensate for such loss.

In the field of dental health, many people adhere to the erroneous idea that the increased consumption of calcium in the form of lime water, calcium tablets and foods known to have a high calcium content will reduce the susceptibility of the fully erupted tooth to damage by caries. In fact there is no possibility of calcium's fortifying the fully formed enamel or altering the progress of destruction of calcium structures by acids formed in the fermentation of sugar. A diet rich in calcium is required by the growing child, but calcium supplements have no substantial effect on the teeth of children who have passed eight years of age.

Another fallacy is that natural foods—sugars and starches found in honey, dates, figs, vegetables and so forth—are harmless to teeth. In truth the simple sugars, sucrose and fructose, are fermentable carbohydrates that can be converted into decalcifying acids by oral bacteria.

There is a widely held belief that sweets and confections are essential to normal nutrition, to assist digestion of other foodstuffs and to ensure enough energy for healthy living. The body is incapable of utilizing carbohydrates consumed in excessive quantities.

Basic science



Biophysics

Investigation of tooth function during mastication

(Untersuchungen über das Verhalten menschlicher Zähne beim Kauvorgang)

Günther Beck. *Deut.zahnärztl.Zschr.* 11:162-169
Feb. 1, 1956

The masticatory system in man is undergoing a series of retrogressive changes. Dental caries and periodontal disease are on the increase, and the number of patients with underdeveloped jaws and irregularities of the dentition is alarming.

In embryos, the oral cavity is formed by an invagination of the ectoderm. In the early embryonic stage, the mouth is separated from the digestive system until, during the fourth week, the rupture of the buccopharyngeal membrane occurs. When the infant stuffs objects into his mouth, it may not necessarily indicate hunger but may show that the mouth is being used in its primary tactile activity.

Numerous studies have been carried out on masticatory pressure, but the sensitivity of the teeth to loads applied in different directions during masticatory function has not been investigated systematically.

At the Institute for Physical Research of the University of Hanover, Germany, investigations were carried out to determine tooth function during mastication. Measurements of the masticatory forces tolerated by the teeth in an axial direction were recorded.

These measurements were taken with extracted human teeth which were put under a hydraulic press that imitated the movements of the jaws during mastication. The strength of the masticatory

forces exerted on the teeth in the axial and the lateral direction (load and stress) was determined by wire resistance gauges. In the same manner, the pressure and strain applied to the tooth's diameter and circumference were measured.

It was established that the strain on the tooth circumference produced by a load of about 60 Kg. on the tooth surface is approximately 1 micron.

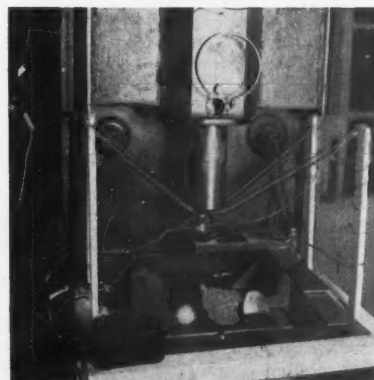
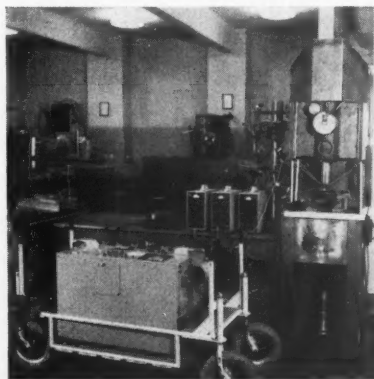
The established, so called "tooth characteristic formula" was as follows:

$$y = \frac{\text{force per square millimeter}}{\text{relative diameter increase}} = 6 \text{ to } 10.3 \frac{\text{Kg.}}{\text{sq. mm.}}$$

By the use of such an established tooth characteristic number, possible sources of error can be avoided by comparing the result obtained with one tooth with that obtained with another.

Top picture: Apparatus used for determination of dynamic traction in human teeth

Bottom picture: Apparatus used for measurements of masticatory force exerted on human teeth



Statistically, such errors can be: (1) in the same tooth and in the same position, 3 per cent, usually caused by faulty measuring instruments; (2) in the same tooth but in different positions, 20 per cent, and (3) in different teeth and in different positions, 30 per cent.

The position of each tooth is significant for establishing the tooth characteristic formula. Several positional variations, may occur in the same person and in different persons.

The masticatory force as a "function of time" was measured with an oscilloscope. First, two artificial molars were used, and the test later was repeated with two extracted molars. It was established that during the biting process, the strength exerted on the teeth decreases, and this decrease is paralleled by a decrease of strain.

It was also established that the force exerted in biting is far greater than the stability of an isolated molar. To withstand this force, a balanced occlusion is essential.

The habits of mastication do not change when teeth deteriorate. By chewing hard food constantly, diseased teeth are not compensated for by a better masticatory function. Strain seems to be a necessity for the life of a tooth. If proper mastication does not achieve the necessary value of strain, an increase in microorganisms occurs. This pathologic increase of bacteria in the oral cavity, accompanied by a constant retention of food particles, seems to be closely associated with the incidence of caries.



Psychology

Dentistry and hypnodontics (Dentisteria e hipnodoncia)

Salvador Lerman. *Tribuna odont.*, Buenos Aires
40:126-140 May-June 1956

Hypnosis was first used in dentistry about 100 years ago. It does not compete with general anesthesia, because the latter is applicable to all patients whereas hypnosis can be induced only in one out of every five persons.

The dentist who plans to use hypnodontics must have no personality problems of his own. He must have a pleasing character, because pleasantness favors hypnotic induction. His strength is not physical in nature, but based on his psychological presentation. Hypnosis is not a drug that acts, as in anesthesia, but is caused by the dentist's pleasant and persuasive talk.

Hypnodontics is clearly indicated in operative dentistry when the patient is nervous, excitable or apprehensive, dominated by fear of the drill, the needle or the mere sight of the instruments, or afflicted with abundant salivation or uncontrollable gagging.

Hypnosis dominates all such unfavorable conditions, and cavity preparation can then be accomplished quietly, painlessly and correctly. When necessary, anesthesia is easily administered without fear of the needle.

Hypnosis is also useful in impression taking, as it not only controls sialorrhea, but also eliminates gagging, swallowing and muscular contractions. When deep enough it permits tooth extraction.

But failures do exist. Only one in five patients can be hypnotized. On the other hand, in no way does it injure the patient.

Hypnosis. Its miraculous aspect and possible injuries (Hipnose. Seu aspecto milagroso e possiveis maleficios)

Aluizio Gonçalves. *Rev. brasil. odont.* 14:165-170
May-June 1956

When a patient is susceptible to hypnosis, it is as easy to hypnotize him as it is difficult to know what takes place in his subconscious or unconscious mind during hypnosis.

It would appear that hypnosis is a neurophysiologic phenomenon linked to Pavlov's conditioned reflexes.

In the bibliography consulted, only one reference is made to injuries subsequent to hypnosis. These possible impairments are an exacerbation of an incipient psychosis, an undue subordination of the patient to the hypnotizer, the implantation of hallucinations, spasms, nervous crises, convulsions, depressions or melancholies.

It is unwise to hypnotize people with split personalities. Therefore the operator should ac-

quire some knowledge of applied psychology, and hypnotize a patient only after obtaining some information on his psychological peculiarities.

Because hypnosis is related to the libido it should be used on female patients only in the presence of a witness, and never on a patient who is sympathetic toward the operator.

It is a state of intense concentration, and neuroses can be produced if suggestions are applied violently or are antagonistic in character. It may also be dangerous to hypnotize the same patient several times.

Its benefits in dentistry are many and varied, and derive from the fact that hypnosis produces sialoschesis, hemostasis, anesthesia, analgesia, and is the only known method of controlling postoperative pain.

Facial deformity and inferiority complex (Gesichtsentstellung und Minderwertigkeitsgefühl)

Susanne Arnold-Ceranke. *Zschr.psychosomat. Med.* 2:193-199 April 1956

After World War II, an increase in the demand for facioplasty has been observed in many countries. It has been the experience of many plastic surgeons that neither the successful operation nor the improvement in esthetic appearance has found the expected response in the patient's mental reaction.

Patients with minor deformities of the face, either inherited or acquired, seem to have reason enough to persist in despair which frequently leads to an inferiority complex.

Patients with major deformities of the face, however, often endure their deformities without complaint until new events suddenly bring about the desire for plastic surgery. In both types of patients, the successful operations are not followed by the expected change in mental attitude. Even if the social and professional activity has become normal, the inferiority complex survives.

Every plastic surgeon, therefore, should consider whether the operation alone will provide the desired effect, or whether psychoanalytic treatment should follow the surgical intervention.

Many persons suffer greatly from true or imagined deformities of their faces. Dentists, orthodontists, oral and plastic surgeons are able to correct true facial distortions, but only a subsequent psychotherapy will enable the patient to overcome his (sometimes treasured) inferiority complex and make a happier life possible.

Training in psychology for practicing dentists (Aufklärungspflicht in der Zahnheilkunde und ihre psychologische Bedeutung)

H. Euler. *Deut.Zahnärztebl.* 10:396 May 22, 1956

The necessity of training in psychology and psychotherapy for practicing dentists is a topic which is neglected in dental literature.

Every intervention in the organism of a living person constitutes a bodily injury, and, therefore, cannot be performed legally without the explicit permission of the patient. Sometimes such a permission can be obtained only after enlightening the patient on the necessity for the intervention. Such an explanation, however, requires tact and a knowledge of psychology on the part of the dentist, because it often forms the basis for confidence and trust between dentist and patient, as necessary in dental practice as are professional knowledge and experience.

This feeling of confidence, however, can be weakened or even destroyed by many factors such as unnecessary or painful treatment methods, misunderstandings of newspaper reports, the attitude of hospital insurance agents and interference by specialists.

The first meeting of patient and dentist (usually when the patient is still a child) is decisive for a favorable or unfavorable relationship between them.

Girls may suffer a psychic trauma by loss or extraction of the anterior teeth.

The dentist must employ psychology when he records the patient's past history. This record should include all information obtainable concerning the patient, his family, his past and present environment, experiences and sensations.

Unfortunately, in daily dental practice, this recording frequently is either neglected or executed carelessly and tactlessly. The dentist must

try to enter the psyche of his patient and must deepen the feeling of trust by psychologically directed inquiries.

Examination should never be begun at the site of pain; only slowly should the dentist come nearer and nearer. A correct and understandable diagnosis and prognosis will strengthen the patient's faith in his dentist for the next appointment; false and too optimistic promises will shatter it.

The dentist must do everything in his power to promote the healing process, and he must avoid everything which may impede it. A good dentist never forgets that the patient's psyche plays an important part in every curative process.



Histopathology

Histopathologic changes

of the oral mucosa during tooth eruption

(Cambios histopatológicos de la mucosa oral durante el periodo de la erupción dentaria)

Carlos Calle, Flavio Uribe Garcia, Heriberto Zapata Herrera, Luis Fernandez Torres and Edgar Llanos Molina. *Temas odont.* 6:4-15 April-June 1956

During eruption, after bone has been perforated, the tooth pierces the soft tissues by pressure with its cusps. To determine the histopathologic changes in the mucosa, 29 patients were examined. Sections of the oral mucosa were obtained, and studied both macroscopically and microscopically.

Patients selected were between 5 and 17 years old. As the object was to study normal eruption, any instance in which there existed a suspicion of degeneration or tumorous growth was rejected.

Age and sex were especially considered in girls because many instances of gingivitis are due to hormonal alterations during puberty, menstruation and pregnancy.

General health was considered so as to reject all patients with vitamin or other deficiencies and because of certain systemic conditions. Finally,

good mouth hygiene was necessary as food deposits and calculus can produce gingivitis.

Specimens were obtained under conduction anesthesia whenever possible, because infiltration tends to tear the tissues. They were planned to include normal mucosa so as to be able to compare normal with pathologic tissues. The size of the specimens varied, but their shape was generally oblong, and when the mucosa was pierced the perforation was planned to occupy the center of the specimen.

The surgical procedure tried to respect the integrity of the specimen and its tissues. The specimen was immediately placed in a formaldehyde solution.

Study of the several specimens indicated that eruption produces bone rarefaction as a result of pressure from the tooth germ.

After bone destruction, changes take place in the connective tissue. These are atrophy and degeneration of the collagen fibers, congestion, hemorrhage, with red blood cells and usually lymphocytic infiltration surrounding the blood vessels. The picture is one of real destruction of all tissues except the enamel organ.

When the mucosa had been pierced, inflammation appeared, secondary to the perforation. The inflammation was due to the accumulation of food and debris.



Pathology

Physiology and pathology

of the salivary glands (Zur Physiologie and Pathologie der Speicheldrüsen)

S. Rauch. *Schweiz.med.Wschr.* 86:771-775 July 7, 1956

Although the salivary glands are located close to the surface and are accessible for clinical and palpatory examination, physiologic and pathologic conditions of these glands are neglected in medical and dental literature.

Inflammation of the salivary glands frequently is secondary to infections of other parts of the

oral cavity. They often occur as a sequela to infection of the salivary ducts or of the parotid glands as accompanying symptoms of septicemia, pyemia or other exhausting diseases.

Salivary calculi usually are phosphatic, but sometimes they consist of carbonates. Obstruction by inflammation, by surrounding fibrosis or by salivary calculi may lead to distention of the salivary ducts, or to a sialoceles with a subsequent atrophy of the glands. Obstruction of the sublingual duct may cause distention of the duct on its orifice under the tongue, producing ranula.

Tuberculosis only rarely affects the salivary glands. If it occurs, the disease is either a miliary tuberculosis or a conglomerate type which may break down to form a cold abscess.

If actinomycosis occurs in the salivary glands, it usually is subsequent to its previous occurrence in other parts of the oral cavity.

Sarcoidosis may manifest itself primarily in the parotid glands, leading to painless, often bilateral, firm swellings. Involvement of the parotid glands is often caused by uveoparotid fever of sarcoidosis.

Tumors of the salivary glands are infrequent. If they occur, they are mainly in the parotid gland and occasionally in the submaxillary salivary gland; the sublingual gland is involved rarely.

Little is known about vascular disturbances of the salivary glands. Different types of sialadenitis and sialodochitis are known, and for the differential diagnosis, the following temporary classification is important. The isolated symptoms and syndromes can be divided into four main groups and several subordinate groups.

Group I. Preponderance of allergic components:

1. Achroacytosis, proliferation of reticuloendothelial cells, and generalized sarcoidosis as primary diseases; uveoparotid fever, histoplasmosis, actinomycosis and other mycoses as secondary diseases.

2. Sjögren's syndrome as a rheumatic primary disease with complications in the digestive and respiratory tracts, sometimes accompanied by generalized collagenic diseases.

3. Sporadic allergies in instances of ascariasis, hay fever, rheumatism, and focal infection in teeth or tonsils.

Group II. Preponderance of hormonal components.

1. Sex hormones: swellings of salivary ducts during puberty, menstruation, pregnancy, lactation and menopause; hypogenitalism and infection in the reproductive organs.

2. Thyrotrophic hormones: hypothyroidism, myxedema and pituitary adiposity.

3. Adrenocorticotrophic hormones: pituitary basophilism (adrenal-cortical hyperfunction), postoperative parotitis, submandibular swellings (in elderly patients) and marasmus.

4. Insulin deficiency in combination with other hormone deficiencies.

Group III. Preponderance of neurogenic components:

1. Cerebral adiposity, oligomenorrhea, and parotid swellings.

2. Endogenous obesity.

3. Encephalitis and ptialism.

4. Paralysis agitans.

5. Facial sympathetocalgia: erythroprosopalgia, neuralgia of the sphenopalatine ganglion, Charlin's and Bebel's syndromes.

Group IV. Preponderance of deficiency components:

1. Kwashiorkor.

2. Starvation diseases.

3. Avitaminoses: deficiency of vitamin B complex, vitamin A or vitamin C.

4. Sjögren's syndrome in elderly patients.

This temporary classification gives a general view for the differential diagnosis of disturbances in the salivary glands. Various symptoms, however, are not determined, and numerous problems have not as yet been solved.

Treatment of dental focal infection

(Die zahnärztliche Therapie bei der odontogenen Herderkrankung)

Martin Herrmann. *Zahnärztl. Praxis* 7:1-4

Feb. 1, 1956

A focus of infection can be described as a circumscribed region of tissue infected with pathogenic microorganisms. Foci of infection are either primary or secondary. Primary foci usually are located in tissues communicating with mucous or cutaneous surfaces. Secondary foci are the direct

result of infections from other foci through contiguous tissues, or have been carried from the primary infection by blood or lymph streams.

A number of dental foci are included in primary oral infections: gingivitis and gingivostomatitis, infected root canals, vital or nonvital infected pulps, periodontitis, alveolar abscesses, apical and periapical infections, infected impacted teeth, retained infected roots, residual infection of osseous tissue after tooth extraction, infected cysts and osteomyelitis of the jaws.

All foci of infection should be removed because their presence lowers the resistance of the organism and facilitates future infections.

It is important to be concerned about dental focal infection before oral surgical intervention on patients with rheumatic heart disease is attempted, because of the frequency with which such patients develop subacute bacterial endocarditis when not protected adequately by antibiotics.

There is insufficient evidence to support the hypothesis that an etiologic relation exists between dental focal infection and arthritis.

In instances of dental focal infection, dentists and physicians must make an accurate scientific diagnosis by the determination of the specific bacterial strain involved in producing the symptoms.

Bacteremia often follows dental operations and causes subacute bacterial endocarditis; therefore, dental foci of infection should be removed immediately after detection.

Cooperation between dentist and physician will make the difficult task of diagnosis and prognosis easier.

Malignant tumors of the tongue, the floor of the mouth and the pharynx

E. M. Skolnik. *J. Internat.Col.Surgeons*
26:242-248 Aug. 1956

Carcinomas of the oral cavity comprise about 4 per cent of all malignant growths and are invariably of the squamous cell variety. The large number of instances encountered makes it imperative that careful examination of the oral cavity be made, particularly by the dentist and the

otolaryngologist who have such intimate contact with this region. A program of cooperation will lead to early diagnosis of the primary lesion and to a higher percentage of cures associated with better functional and cosmetic results. Biopsies of all suspected lesions must be performed to accomplish this end.

In the order of frequency, carcinoma of the tongue involves the lateral border, the superior surface, the tip and, rarely, the inferior surface. The prognosis as well as the therapy of choice depend on the size of the tumor, the histologic picture and the presence or absence of metastasis. The location of the lesion influences the outcome. Any malignant tumor near the midline has a poor prognosis, owing to the possibility of cross metastasis. In the anterior third of the tongue the lesions are usually superficial, do not invade the muscle and are slow to metastasize. The treatment of choice is wide surgical excision. In the middle third, which is the most common region of involvement, the routine hemiglossectomy may suffice. In the base of the tongue, lesions without metastases are rare. This indicates a poor prognosis, and, wherever possible, primary surgical extirpation is to be preferred.

Cancer of the floor of the mouth may appear as a superficial ulcer or papillary growth that is prone to extend to the submucosa, invading the musculature and the submaxillary gland. Metastases occur readily to the submaxillary and deep cervical lymph nodes on the same side and often on the opposite side.

The causes of failure in the treatment of intra-oral carcinoma are the delay of the patient in seeking medical advice, refusal of the patient to complete the recommended therapy, delay by the referring physician in initiating adequate therapy, inability to control the primary lesion, with repeated recurrence and metastasis, the presence of lymph nodes and bone involvement in relation to the difficulty of treatment, and inadequate follow-up.

The treatment of malignant tumors of the tongue, the floor of the mouth and the pharynx, with the indications and contraindications for surgical intervention in each instance, is discussed, and the value of roentgen irradiation and interstitial irradiation in certain instances is estimated.

Bilateral mixed tumors of the parotid glands

Norman H. Baker, John R. McDonald,
B. Marden Black and Joseph E. Geraci.
Proc. Mayo Clin. 31:428-430 July 25, 1956

Bilateral mixed tumors of the parotid gland are rare; five cases have been reported in the literature. A recent case is reported which is remarkable for several reasons: first, because the tumor is bilateral and second, because the frequency with which such tumors can recur is illustrated. The patient's long history of neoplastic involvement (tumor removed from the left parotid gland in 1930, a recurrent tumor removed in 1942 and a second recurrent tumor removed shortly afterward) is rather typical of benign mixed tumors of the parotid gland.

The 69 year old white woman was found to have multiple masses about the head and neck. In the left angle of the mandible were several firm, subcutaneous masses that measured 1 cm. in diameter; on the right, behind the angle of the mandible, was a firm mass that measured 2.5 cm.; the left lobe of the thyroid gland was enlarged and nodular, and there was a fourth mass, 3 cm. in diameter, which was soft and movable, in the left deep jugular region. The masses were excised. Malignant disease was not evident.

Some considerations on fluorosis and hyperthyroidism: presentation of a case (Ligeras consideraciones acerca de fluorosis e hipertiroidismo. Presentacion de un caso)

Raul Reinefeld. *Venezuela odont.* 20:25-29
June 1956

Artificial fluoridation of drinking water increases the resistance of teeth to caries when used 1.5 ppm for deciduous teeth and 2 ppm for the permanent dentition.

Whereas artificial fluoridation is beneficial, natural fluoridation frequently is injurious if present in a harmfully high concentration. Chronic fluorosis produces a dental dystrophy known as mottled enamel, which presents small white stains when mild, and a partial loss of enamel with an appearance of black decay if intense. This latter situation may be accompanied by a retarded dental eruption and abnormal implantation, associated with gingivitis and periodontal disease.

Chronic fluoride intoxication also produces severe systemic alterations, especially arthralgia, myalgia and rigidity.

The thyroid gland is a ductless or chylopoietic glandular body at the upper part of the trachea consisting of two lateral lobes connected centrally by an isthmus. It contains a viscous liquid with thyroxine, recognized as a hormone, and diiodothyroxine.

Hyperfunction of the thyroid gland has evident systemic effects, and is most frequent in young adults. Its usual symptoms are nervous excitability, exophthalmos, loss of weight, insomnia, digestive disorders and such cardiovascular alterations as tachycardia, palpitations and hypertension.

The thyroid gland is closely related to the oral cavity, and its hyperfunction is frequently increased by the presence of septic foci in the mouth, though not actually initiated by these foci.

Hyperthyroidism causes oral disorders, such as greater propensity to dental caries and increased flow of saliva.

Both these diseases, fluorosis and hyperthyroidism, follow geographical patterns, and are most frequent in the west of the country (Venezuela).

All these conditions were present in a girl, 17, whose oral lesions were treated by a dentist while the systemic disorders required medical treatment.

Oral surgery



Fractures

A removable wire suture for internal fixation of mandibular fractures

Thomas Gibson and Ian McD. Allan.
Brit. J. Plast. Surg. 9:117-124 July 1956

Open reduction of otherwise irreducible mandibular fractures is well established surgical practice. The reduction obtained at open operation is never stable, and direct interosseous fixation by means of wires or plates is essential for immobilization.

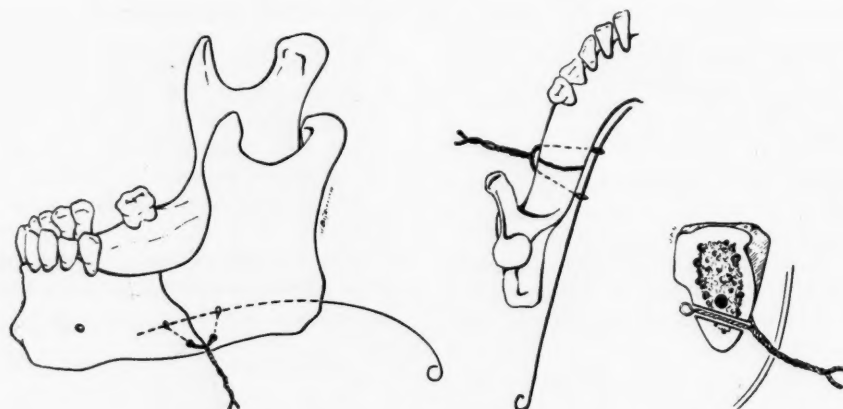
Interosseous wires and plates are usually regarded as permanent fixtures. Although buried metal may be biochemically inert, it still suffers

from the defects inherent in any foreign body. Infection may develop spontaneously or following minor trauma; once established, it will not subside until the metal is removed. Pain and tenderness over the wire also may occur in the absence of infection.

To overcome the disadvantages of permanently buried metal, a wire suture has been designed for interosseous fixation. The suture can be removed easily at any time without recourse to further operation. It is simple to insert and provides a degree of stability at least equal to the wiring technics in common use.

Two varieties of wire are used—hard stainless steel wire 0.8 mm. in diameter, cut in six inch lengths and sharpened at one end, and malleable stainless steel ligature wire 0.35 mm. in diameter; this is first cut in 12 inch lengths, each of which is folded on itself and twisted in the lathe to form an eyelet large enough to accommodate the first wire. Two eyelets and one length of hard (so-called "piano") wire are required for each fracture.

The fracture is exposed through a submandibular incision. The bone ends are cleared and put into apposition. Holes are drilled in each fragment with a 5/64 inch drill, each hole beginning as near the lower border and as close to



The position of the wires in a typical fracture near the angle. The eyelets are passed through holes which begin near the lower border of the mandible and close to the fracture line (left illustration); as the eyelets pass through the bone they diverge (center illustration) and incline slightly upward (right illustration). This angulation permits easy withdrawal. The wires projecting from the skin are unobtrusive and the wounds heal rapidly after withdrawal

the fracture as possible; the drill is angled so that it passes slightly upwards and away from the fracture line. Where the fracture is oblique in the vertical plane, the drill holes must be so situated that a line drawn between them crosses the fracture at right angles; otherwise the fragments tend to be pulled out of alignment when the wires are tightened.

One of the prepared eyelets is passed through each hole from without inwards. The sharpened end of the hard wire is pressed through the skin just behind the angle of the mandible so that the wire comes to lie on the lingual aspect of the bone. It is then passed through each eyelet in turn and projects beyond them an inch or so. An assistant steadies the fragments in correct apposition until the eyelet wires are twisted tight. The wound is closed in the usual way, the twisted ends of the eyelets being brought out through a separate small stab wound below the main incision. Complementary intermaxillary fixation by whichever method is suitable for each instance is used.

To remove the suture, the hard wire is first withdrawn; the eyelets thus are freed and can be removed. If these have been inserted in divergent fashion as described, little force and no anesthesia are required.

The results of the method in the treatment of 14 fractures in 12 patients has led to the following conclusions:

1. The method is suitable for internal fixation of any fracture of the mandible requiring operative reduction.
2. It provides good stability and may be used alone, but intraoral and intermaxillary fixation should be applied wherever possible.
3. It may be used in the presence of gross contamination of the fracture.
4. The wires should be removed at once if infection is not controlled by antibiotics. If retained they may lead to osteitis and sequestration.
5. There is little tendency to redisplacement of the fractures after removal of the wires during the second week, presumably because of fibrosis around the bone ends.

Fractures of the mandible in children under the age of six years

W. Donald MacLennan. *Brit.J.Plast.Surg.*
9:125-128 July 1956

The problems associated with the management of fractures of the mandible in young children merit attention because of aspects peculiar to this age group.

The young injured child frequently is apprehensive. Examination and treatment, unless the child is under heavy sedation or general anesthesia, seldom can be accomplished adequately. The anatomic characteristics of the bone, teeth and soft tissues in the young emphasize the need for a more studied approach than that given to the adult.

Fractures of the mandible in children under six years old account for less than 1 per cent of all fractures of the mandible. Motor accidents and falls from a height are the most common causes. There is no significant difference in the sex incidence. The sites of fracture, in order of frequency, are as follows: (1) unilateral fracture of the body of the mandible; (2) unilateral fracture of the body of the mandible on one side, with a fracture of the mandibular condylar process on the opposite side; (3) unilateral fracture of the mandibular condylar process; (4) fracture of both mandibular condylar processes (with or without a fracture in the incisor region of the body of the mandible), and (5) bilateral fractures in the body of the mandible in the region of the mental foramina.

The soft nature of the developing bone predisposes to the "greenstick" type of fracture. Fractures involving the body of the mandible frequently show a considerable degree of displacement, and the fracture lines tend to be long and oblique, running from the upper border of the mandible downward and forward; this is in contradistinction to the more common line of fracture in the adult, which runs downward and backward. In the condylar region the fractures commonly are of the "greenstick" variety. These are of the "low" type and do not, as a rule, give rise to any disturbances of mandibular development at a later date. Fractures of the "high" type are often associated with dislocation. The frac-

ture dislocation of the condylar process in the young child must always be viewed with concern, because of the likelihood of secondary growth anomalies from damage to the condylar growth center.

Fractures involving the body of the mandible frequently involve the permanent tooth follicles, but seldom is it necessary to remove these. Treatment for the young child should be carried out as rapidly and as completely as possible in the minimal number of sessions. Where possible, reduction and fixation should be achieved at the same time.

The deciduous dentition does not lend itself, by virtue of the shape of the teeth, to the dental wiring methods, and extraoral pin fixation is contraindicated because of the possible damage to the permanent tooth follicles. A simple Gunning-type splint in acrylic resin can be prefabricated, lined with black gutta-percha to allow for minor discrepancies in alveolar contour and teeth, and applied. The advantage of such an appliance lies in the fact that the patient is subjected to one surgical intervention, with the reduction of the fracture, insertion of the splint and final fixation. The fixation is simple, rigid, not readily disturbed, and makes it easy to maintain oral hygiene while the splint is in place.



Extractions

Thrombophlebitis of the cavernous sinus after tooth extraction

(Über eine nach Zahnextraktion entstandene Thrombophlebitis des Sinus cavernosus)

D. Haunfelder and J. Gerlach.

Zahnärztl. Rundschau 65:215-220 May 5, 1956

Thrombophlebitis of the cavernous sinus usually accompanies an acute suppuration in the region of the soft parts of the face, a rhinogenous or oral focal infection. Through the network of veins, this disease can easily reach the blood stream.

Most instances of thrombophlebitis reported in medical and dental literature were sequelae to

an infection. Surgery frequently was attempted too late.

The Clinic and Polyclinic of the Dental Institute of the University of Würzburg, Germany, published a report on studies of thrombophlebitis of the cavernous sinus occurring after (1) endodontic treatment of upper bicuspids; (2) periosteitis in the region of the anterior teeth and (3) extraction of upper cuspids and lower third molars.

The phlegmonous inflammation, originating in the upper jaw, progresses over the retromaxillary region to the pterygoid process and then to the orbital region.

Suppuration beginning in the lateral parts of the upper jaw migrates into the regions of the spatium interfasciale, the temporal fossa and the base of the skull.

Observations of other instances of thrombophlebitis revealed that the submaxillary or the sublingual region also was afflicted. The main causes were acute periodontal diseases or disturbances in the eruption of lower third molars. Other causative factors were severe osteomyelitis in the mandible and extraction wounds after elimination of carious and, sometimes, symptomless teeth. In isolated instances, infection occurred after treatment in which nonsterile instruments had been used. Such a danger exists, especially during anesthesia in the region of the maxillary tuberosity, because vascular trauma and subsequent hematoma may occur.

The main symptoms of progressive thrombophlebitis of the cavernous sinus are shivering, congestion of the veins in the orbital region, and chemosis or paralysis of ocular muscles and nerves. When only posterior parts of the sinus are affected, fewer symptoms are observable, but sometimes paralysis of the cranial nerves occurs.

In the case reported, thrombophlebitis of the cavernous sinus developed after extraction of a carious upper third molar, performed under local anesthesia. The inflammation started in the pterygoid plexus and advanced with abscess formation to the temporal lobes.

Treatment consisted of a comparatively minor neurosurgical intervention and antibiotic therapy.

The correct evaluation of symptoms present, repeated examination of alterations in the oral cavity and, if possible, of the general health con-

dition, are necessary with each tooth extraction. In all instances in which inflammatory processes have reached the intracranial spaces, the patient should be referred immediately to a neurosurgeon, because inflammations in the retromaxillary region may cause death.

**New method for loosening teeth
before extraction: utilization
of iontophoresis**

(Eine neue Methode zur Lockerung von Zähnen
vor Extraktion mittels Iontophorese)

S. Seidner, Tel Aviv, Israel.

Schweiz.Mschr.Zahnhk. 66:760-766 Aug. 1956

The treatment of a disease or of a diseased region by the combined use of a drug and an electric current to introduce ions of soluble salts into the tissues involved is called iontophoresis.

When used in conjunction with an antiseptic for treatment of local infection, the method is referred to as electrosterilization or ionization.

The simultaneous use of direct current and diathermy from the same electrodes is called iontopherapy.

Frequently, teeth which seem to be loose during primary examination, prove to be firmly attached in their alveoli when extraction is attempted. A comparatively slight loosening of the tooth crown had caused the impression of looseness. In many instances, the tooth is brittle, and its structures shatter like glass at the slightest pull before the root can be loosened. Bicuspids and molars with curved and firmly attached roots, and teeth in which hypercementosis is present, are especially difficult to extract. Broken roots frequently produce serious complications.

A method using iontophoresis for loosening teeth before complicated extraction has been introduced recently. Tests made at several European dental clinics produced favorable results.

An anesthetic may be used in connection with iontophoresis. The positive pole is placed in the root canal. Although a slight periodontitis sometimes occurs, the negative pole acts as an anti-inflammatory agent, minimizing the irritation.

Iontophoresis will loosen even the most firmly imbedded tooth in the shortest time possible.

Hyaluronidase, applied in the root canal of gangrenous teeth or in the pulp chamber of vital teeth, can be transported by iontophoresis with a current of from 3 to 4 milliampstroms within from 35 to 40 minutes. It is recommended, however, that the patient be anesthetized again before extraction is performed, even in instances in which the tooth appears to be considerably loose in its socket.

**Factors influencing bacteremia
following dental extraction**

Frank Coffin and R. E. M. Thompson. *Lancet*
271:654-656 Sept. 29, 1956

That a transient bacteremia follows dental extraction is widely recognized. Factors are investigated which might influence the frequency with which organisms can be recovered from the blood stream after dental extraction.

Only simple extractions were studied. Organisms were isolated from 249 of the 1,223 samples of blood taken from 958 patients.

The greater the number of roots removed, the greater was the incidence of positive blood cultures.

An incidence of 8.1 per cent positive blood cultures was produced by the extraction of bicuspids; of 9.28 per cent by lower molars, and of 14.57 per cent by upper molars.

The technic of the operator is all-important in influencing the degree of bacteremia induced by dental extraction. Undue rocking or instrumentation of a tooth during extraction is likely to cause a greater number of organisms to be pumped into the blood stream.

The most difficult extractions had the highest incidence of bacteremia. Teeth which were exceptionally easy to remove were also responsible for a large number of positive blood cultures; these teeth were easy to remove because they and their supporting structures were grossly infected and had an increased blood supply caused by acute inflammation.

The highest incidence of bacteremia (21.5 per cent) was in patients with periodontal disease, which suggests that infection of the supporting soft tissues is more important than infection of the bone.

The incidence of bacteremia after dental extractions is probably less than is sometimes stated. Organisms which are rare in the mouth but are common skin commensals should be excluded as being contaminants of the venepuncture.

Cultures of blood taken by cardiac catheter would be of value in determining the true incidence of postextraction bacteremia because blood so obtained has not passed the pulmonary bed or the peripheral capillary bed, and there is less risk of organisms being filtered out of the blood stream before reaching the operator's syringe.



Anesthesia and analgesia

The role of hypnosis in anesthesiology

Milton J. Marmer. *J.A.M.A.* 162:441-443
Sept. 29, 1956

Instruction in the principles of hypnosis should be incorporated into the training in anesthesiology, and every anesthesiologist should also be a hypnotist. Hypnotism, which paved the way for the acceptance of ether and chloroform by drawing attention to the possibility of surgery without pain, was dealt its death blow by the advent of these anesthetic agents. By 1860, mesmerism and surgery had parted company. The more chemical anesthesia increased in efficiency, the less significant hypnotism became as a means of anesthesia.

Scientific and medical interest in the subject was first aroused in the eighteenth century by Anton Mesmer. James Braid, a Manchester surgeon, introduced the term "hypnotism" in 1843. The first attempts to perform surgery while the patient was under hypnosis were made in France, by Dupotet and Recamier, in 1821.

Hypnotism is the only means of anesthesia that carries no danger for the patient. Hypnotism raises the patient's threshold to pain. Hypnotism can be maintained for long periods and terminated at will, and it has the superlative advantage of placing no extra load on the circulatory, respiratory, hepatic or renal systems.

Hypnoanalgesia is especially useful when employed in conjunction with other anesthetic procedures. Hypnosis alone can be employed in such procedures as extractions of teeth. Hypnodontia is a well-recognized and useful field of dentistry.

Patients vary in their susceptibility to hypnosis, and a deep hypnotic level cannot be reached in every instance. The only disadvantage to hypnosis is that its effective application requires a considerable expenditure of time, a negative quality that is more than offset by its many advantages.

A case is reported in which hypnoanalgesia was employed effectively during a resection of the lingula for tuberculoma of the upper lobe of the left lung.

Prevention of explosions in operating rooms (Zur Verhütung von Explosionen in Operationssälen)

H. O. Kleine and H. Winck.
München.med.Wschr. 98:1281-1282
Sept. 21, 1956

Operating room accidents from fire or explosion during anesthesia in which combustible anesthetics have been used are reported frequently. It is not surprising that such accidents occur, because the majority of anesthetic gases commonly used are highly explosive and adequate precautions to prevent explosion hazards are seldom taken.

Explosions in the operating rooms can be caused by electric and nonelectric factors. Non-electric sources are: (1) smoking; (2) use of matches; (3) use of alcohol lamps, and (4) use of gas burners. Electric sources are: (1) use of potentially hazardous equipment (motors, cauteries, foot rheostats and suction machines), and (2) formation of electric sparks in the vicinity of the apparatus for anesthesia.

Incorrect manipulation of bottles and tanks containing anesthetics or the use of scratched glass containers or of implements of inferior quality add to the explosion hazard.

To avoid explosions in operating rooms, the physical and chemical properties of the anesthetic gases used and their relative explosive properties should be understood. All explosion-producing

appliances such as the cautery, diathermy and roentgen equipment must be adequately grounded so as to make the floor (earth) a part of the electric circuit. The static hazard must be understood and all static-producing materials such as wool, rubber, silk, nylon and plastics should be replaced by safer materials whenever possible. The use of conductive floors should be mandatory.

The most important phase in preventing explosions in operating rooms is the proper education of the personnel. Knowledge of the nature of the explosion hazard and employment of all the available preventive measures will make the occurrence of anesthetic explosions extremely rare.

General anesthesia with Trilene in dentistry (Anestesia geral pelo Trilene en odontologia)

Edgar William Allan. *Rev.brasil.odont.* 14:133-150 May-June 1956

Trilene is a purified derivative from trichloroethylene, to which has been added 0.01 per cent of thymol as a stabilizer and preservative. It is a powerful anesthetic, more potent than nitrous oxide, and less active but also less toxic than chloroform.

Both the absorption and the elimination of trichloroethylene takes place in the respiratory tract. On arrival at the lungs it passes into the blood stream, and is transported by the red cells to the nerve tissue where it is fixed by the lipoids.

Many authors consider trichloroethylene as an analgesic, but the author uses it as an anesthetic indicated in any type of patient, for anesthetics for from ten minutes to five hours. It is effective in so-called anesthesia-resistant persons; for example, chronic alcoholics and smokers.

Induction should be slow. When fast, tachycardia, bradycardia or tachypnea may appear. It is a safe anesthetic, and the lethal dose is much higher with trichloroethylene than with chloroform.

Trichloroethylene has many advantages. It requires simple equipment and is easy to transport and low in cost. Induction is quick, and unfavorable reactions are practically nonexistent. It does not irritate the respiratory tract.

The danger symptom to watch for is tachycardia, and the situation is easily handled merely by removing the face mask and allowing the patient to inhale air.

Hyaluronidase used in dental anesthesia

(Contributio pratico sull'utilità della ialuronidasi nelle anestesie di interesse stomatologico)

Umberto Fabris. *Riv.ital.stomat.* 10:1484-1495 Dec. 1955

Various methods have been tried to overcome the patient's apprehensiveness regarding intra-oral injection. Most people fear injections of any kind, especially one made into the sensitive mucous membrane of the oral cavity. Indeed, both the "drill" and the "needle" are the instruments which make many people reluctant to visit the dentist.

To reduce apprehension, surface anesthesia often is used in dental practice. This method, however, has not obtained satisfactory results. Selection of the drug suitable for an analgesic application to the surface of the mucous membrane always is difficult. Cocaine hydrochloride, ethyl ammobenzoate, amethocaine hydrochloride and many other anesthetics have been tried with varying degrees of success. Procaine hydrochloride, the principal drug used in injection anesthesia, is not a surface anesthetic.

Additional difficulties in surface anesthesia are caused by the lack of an adequate vehicle, either in the form of an ointment or an aqueous solution, which would permit undisturbed penetration of the anesthetic into the epithelium and the necessary reaching of the nerve endings in the oral mucous membrane. Another disadvantage is the long waiting period before the anesthetic action begins. It is doubtful whether surface anesthesia has lessened the patient's apprehensiveness.

At the Dental Clinic of the University of Ferrara, Italy, the action and effect of hyaluronidase added to 5 per cent lidocaine hydrochloride has been studied. Hyaluronidase is an enzyme which hydrolizes hyaluronic acid, increases the permeability of the skin to large molecules and acts as a spreading agent. The hyaluronidase used in

these studies was testicular hyaluronidase from bovine testes.

Terminal and conduction anesthesia were used for tooth extractions, for scrapings of the alveolar bone, for surgical elimination and postoperative treatment of radicular cysts, and for preparation of tooth stumps serving as abutments for bridges and dentures.

Hyaluronidase acts to increase permeability and fluid absorption, thereby decreasing the induction time, but does not change the period of anesthetic effect. It permits the use of smaller quantities and weaker concentrations of anesthetics.

The results obtained indicated that the anesthesia was deeper and reached wider regions, and blood coagulation, postoperative course and cicatrization were improved in all instances in which hyaluronidase was used.

Histologic examinations of the reaction of the pulp to hyaluronidase were not carried out; however, no complications or side effects were observed clinically.

The studies were made in instances in which epinephrine or compounds of the epinephrine type were used. When, instead of epinephrine, other vasoconstrictors were used, hyaluronidase did not increase the permeability, nor did it act as a spreading agent.

**Circulatory response
to sympathicomimetic drugs
during hibernation anesthesia**
(Die medikamentöse Beeinflussbarkeit
des Kreislaufes in der Hibernation)

G. Stedtfeld. *München.med.Wschr.*
98:1070-1072 Aug. 10, 1956

Artificial hibernation, sometimes called refrigeration or hypothermal anesthesia, is a form of local anesthesia now used in medicine and dentistry.

It has been established that by applying extremely low temperatures to certain regions of the living body, insensibility to pain is produced. Freezing of parts prior to operation has been used in the painless removal and implantation of skin grafts, oral surgery and tooth extraction. One hour after artificial hibernation, the anesthesia is complete and surgery can be performed without

the use of additional anesthetics. This type of anesthesia causes no shock to the patient, and decreases greatly the operative risks.

Artificial hibernation also has been found of value in the treatment and prevention of postoperative shock and in retardation of infections.

The staff of the Orthopedic Clinic and Polyclinic of the University of Münster, Germany, recently studied the circulatory response to sympathicomimetic drugs simultaneously administered with phenothiazines while under the effects of local anesthesia or artificial hibernation.

The report covers the investigations on 38 patients; 30 patients were under potentiated anesthesia, and eight under therapeutic hibernation.

Examination revealed that when Effortil, a new German vasoconstrictor similar in chemical structure to phenylephrine hydrochloride, was administered, no epinephrine "reverse" effect occurred in the 38 patients.

The drugs of the phenothiazine groups have opened a therapeutic "new land" for medical and dental treatment. As long as artificial hibernation still is in the experimental stage—clinical use, as progressive as it may be, as yet has not changed this stage—surprises may be experienced with regard to what is theoretically expected and what can be clinically established.

When phenylephrine hydrochloride or related chemical compounds are added to the hibernation-producing drugs, the circulatory system is more accessible to therapeutic effects in spite of the possible "vegetative blockage," and no adverse complication will occur.

**Full mouth rehabilitation
under general anesthesia**

H. Robert Norman. *Internat.J.Anesth.* 3:83-86
June 1956

Nitrous oxide with oxygen is still the most suitable general anesthetic for dental surgery in the office. Its greatest drawback, however, is its lack of potency or inability to produce muscular relaxation. The introduction of curare has increased the usefulness of nitrous oxide with oxygen.

For procedures lasting an hour or so, a combination of thiopental sodium, curare, nitrous

oxide and oxygen, as reported by Baird, Johnson and Berger, is recommended. Straps are not used. Induction is quick and smooth and does not produce anxiety. Recovery occurs with less nausea and vomiting, and the incidence of laryngospasm is reduced. The procedure is described.

The most important undesirable characteristic of curare is its depressing effect on the respiratory and central nervous systems. Curare paralyzes the voluntary muscles. At the close of the operation, if the curare effect is still evident, 1 to 3 cc. prostigmine and 1 cc. homatropine methylbromide are given intravenously and 100 per cent oxygen administered until the curare action is dissipated as shown by the resumption of intercostal breathing and normal jaw tonus. If any doubt exists as to the patency of the airway, the artificial airway should be left in place until the patient reacts sufficiently to expel it.

▼ Miscellaneous

The dentist's responsibility in the field of oral surgery

William T. Ewing. *Pennsylvania D.J.* 23:12-17
Jan. 1956

The quality of oral surgery and its problems should be important to all in the dental profession. Advancement in oral surgery, or in any other dental specialty, reflects immeasurably on the entire dental profession.

An oral surgery service in a hospital should include the following procedures or treatments: extraction of teeth, simple or impacted; treatment of fractures involving the maxilla and the mandible by both open and closed reduction; treatment of osteomyelitis of the maxilla and mandible; treatment of cellulitis of dental origin; treatment of subluxation or dislocation of the temporomandibular joint; treatment of teeth or fractured roots in the antrum; closure of the oroantral fistula; treatment of maxillary and mandibular cysts; biopsies of oral tissues; treatment of tumors of the oral cavity which have been determined

benign; removal of tori, palatal or mandibular, which is essential for planning dentures; intraoral removal of salivary duct stones, and ostectomy for prognathism or micrognathia.

The oral surgeon directs or prescribes pre-operative and postoperative care, trains assistants in his specialty, and serves as a consultant to other dental and medical specialties.

In a few institutions some oral surgeons go much further in the surgical field. This is a local matter; no attempt should be made to enforce it on a national level. Oral surgeons are not plastic surgeons. Should they care to be, they must return to medical school and accept the additional training.

Fees for oral surgery should be kept at a level that the average workingman in the community can pay, if the threat of socialized medicine and dentistry is to be overcome.

Patients are demanding general anesthesia for oral surgery and they are entitled to it. Use of a medical anesthesiologist is not the answer, for the price to the patient becomes prohibitive. The oral surgeon should be adequately trained in general anesthesia.

The oral surgeon has obligations to the general practitioner. His office should always be open to the general practitioner for consultation on the problems within the sphere of his specialty. He should always be ready to help in roentgenographic interpretation. He can advise the general practitioner on surgical problems and the value of surgical technics. His office should be a source of the latest data on drugs and their usages within the oral cavity. If dentists are to accept the help of the oral surgeon, they in turn must support him.

The referring dentist should not prescribe the type of anesthetic to be used or the surgical technic to be employed. When referring a patient, the dentist should offer all the information he has about the patient's condition. If, for instance, the dentist breaks off the head of a bur or an elevator in attempting to remove a tooth, he should give this information to the oral surgeon as it is valuable in treatment planning. The general practitioner should not attempt to quote a specialist's fee, as that is a business arrangement between the specialist and the patient. Nor should the specialist quote fees for restorative or prosthetic work

which the general dentist is to do. To promote the best relationship, the specialist should be allowed to operate his office, and the general practitioner his, without any outside interference.

There is no substitute for surgical judgment

Editorial. Charles W. Mayo. *Surgery* 39:1013
June 1956

The factor of surgical judgment comes into play at the moment of the first consultation with a patient and lasts until the final severance of the doctor-patient relationship. Surgical judgment differs from surgical skill, which implies the quality of technic that, for the most part, is confined to the time a patient actually is undergoing an operation. It is during this period that the quality of judgment should be most dominant over the best of technical skill. This statement is not made with any intent to belittle the value of dexterity but rather to place it in proper perspective.

Neither judgment nor skill is inherited. They are attained in varying degrees by individual effort. Only in the "top flight" surgeon do they approach eventual perfection in balance. Good surgical judgment has its foundation in a knowledge not only of the basic sciences but also of the social sciences and the arts. The bases on which to build are obtainable in premedical and medical schools. It is what is done with the time after finishing medical school that determines the surgeon's rating in judgment. Some acquire good judgment the hard way, by trial and error, at particular expense, in all senses, to the patient; others acquire it by continuing study of the written word from reliable sources, by association with and observation of those of proved good surgical judgment, and by unending constructive criticism of their own work and experience. There is nothing that will limit surgical advancement more abruptly than will a closed mind.

The primary question the surgeon should ask himself in his approach to a patient is, "Can I

justifiably get this person out of having an operation, not into having one?"

The surgeon whom I would select to tend my family or me must first know when not to cut, then when and where to cut, how to cut and when to stop cutting.

Moistureproof pressure dressing for intraoral surgery

Roger G. Gerry and Ingram W. Ogden.
J.Oral Surg. 14:235-236 July 1956

Pressure dressings, when used intraorally, aid the healing of surgical wounds by preventing hematoma formation and the accumulation of intercellular fluid and by immobilizing the soft tissues involved in the surgical procedure.

Intraoral pressure dressings have not been used in the past because standard dressing materials rapidly became saturated with the oral fluids and could be retained in position over the surgical wound for only relatively short periods.

For the past two years the authors have been using condoms packed with surgical sponges to provide prolonged intraoral pressure. Since a dressing of this kind is not saturated by oral fluids, it may be maintained in position for as long a period as may be indicated. This type of dressing has been found to be satisfactory in all respects.

The condom is autoclaved. At the time of the surgical procedure a sterile 4 by 4 inch surgical sponge is folded in half, rolled in a cylinder and inserted into the condom. The excess air is squeezed out and a knot is tied at the open end of the condom. The moistureproof dressing is placed over the elevated soft tissue flap and is immobilized in this position by means of a standard facial pressure dressing. This type of pressure dressing has been used routinely after the removal of deeply impacted mandibular third molars, alveolectomies and repair of oroantral fistulas.

Operative dentistry



Rehabilitation or equilibration

Oral reconstruction

Arnold O. Larson. *North-West Den.* 35:199-204
July 1956

The most important factor in oral reconstruction, whether the patient is dentulous or edentulous, is proper articulation of the opposing teeth. The science of occlusion and articulation of teeth is the cornerstone of all phases of dentistry. Although a patient with perfect articulation is seldom seen, the dentist is not justified in altering the articulation unless some pathologic condition indicates such action.

Selective grinding of the natural dentition should be done carefully and only after a correct bite analysis. The method advocated by Boos of registering the rest position by means of plaster bites is advantageous in all instances involving an opening of the bite, as it can establish easily and quickly the amount of opening permissible, and also establish the centric relation accurately. The method advocated by Lauritzen consists of a registration taken from a centric wax record. A study of the mounted casts will permit the dentist to determine the grinding necessary to overcome premature contacts in centric relation and cuspal interferences in lateral excursions.

As a rule, the natural dentition cannot be ground into perfect balance, as too much tooth structure would be lost. Most occlusions, however, can be improved greatly with a small amount of grinding. Schuyler's rules for grinding should be observed, as follows:

1. Premature contacts when the teeth are in centric position are corrected first. The cusp is ground only if it has premature contact in all eccentric positions; otherwise, the fossa is deepened.
2. Premature contacts in the protrusive position are then corrected, as follows: the buccal upper cusps are ground (to reduce the distolin-

gual incline); the lingual lower cusps are ground (to reduce the mesiobuccal incline).

3. Premature contacts in the lateral movements on the working side are corrected by following the same rules as for the protrusive position, and on the balancing side by selecting carefully for grinding either the upper lingual or the lower buccal cusp. Both cusps should never be ground.

Abrasive paste should never be used in grinding, as the points of the cusps wear faster than the planes and this would throw the dentition out of balance.

The same principles as noted are followed in the construction of artificial dentures. A balanced articulation should be produced with artificial dentures, as the dentist can control most of the factors of articulation.



Inlays and fillings

Dental caries: operative and restorative therapy

J. G. de Boer. *Internat.D.J.* 6:401-415
Sept. 1956

The increasing recognition of the value of indirect pulp capping has resulted in preserving the vitality of countless pulps, and in preventing an equal number of endodontic treatments. Progress in restorative caries therapy has been made with instruments, equipment, techniques and filling materials.

Although much of what G. V. Black taught 50 years ago has lost nothing of its value, ideas on operative and restorative caries therapy have changed in various respects. "Ten commandments" of operative and restorative caries therapy are proposed, as follows:

1. In any cavity the peripheral zone of dentin bordering the enamel must be excavated down to hard dentin.
2. The margins of the cavity must be extended to sound enamel and to the relatively caries-immune zones of the tooth surface.

3. The shape of the cavity must allow the insertion of a restoration which will not loosen or fracture, which will be subject to only minimal changes in form and to changes in volume in as close conformity with those of the tooth as is obtainable.

4. The remaining tooth structure must be strong enough to withstand the forces of mastication.

5. No more tooth structure should be sacrificed than is necessary to comply with the foregoing requirements.

6. All materials should be carefully selected, and used according to technics based on the results of scientific investigations as well as on practical experience.

7. The marginal fit of the restoration should be such that no margins are discernible with a probe.

8. The filling must restore the tooth anatomically and functionally—if visible, also esthetically—to a harmonious part of the masticating apparatus.

9. Any trauma to the pulp and the periodontium, caused by the preparation or the restoration, should be minimized.

10. The treatment should cause a minimum of discomfort to the patient.

Resin restorations in pedodontics

Dorothy E. Hill. *J.Den.Children* 23, Part 1:158-165 Sept. 1956

A review of recent scientific investigations of some of the physical properties of the direct self-curing acrylic resins used in restorations of children's carious teeth reveals that these materials possess inherent physical properties most of which are undesirable in dental restorations. The two least desirable properties generally associated with the failure of the direct self-curing acrylic resins as filling material are their lack of dimensional stability and the low Brinell hardness number. These qualities limit the usefulness of the material to regions of low occlusal forces or stresses.

Although the self-curing resinous material expands as it absorbs water, this expansion cannot compensate for the volumetric shrinkage; there-

fore, the restorations tend to become loose in the teeth, the initial adhesion of the material to the dentin is lessened, and the marginal seal of the acrylic resins becomes poor.

Because of their low Brinell hardness and tensile strength, the self-curing acrylic resins should be used only in regions free from stress. They cannot withstand great stress without distortion. Their use should be limited to Class III and Class V cavities.

Contraction always occurs during polymerization. The slower-hardening resins probably contain more free monomer in the final product and thus shrink less during polymerization, since the more monomer used, the greater is the shrinkage during curing. Differences in shrinkage of various brands of resins are produced principally by amounts of monomer required by the particular polymer. Shrinkage can be reduced by the addition of filler materials; however, the amount of these materials must be limited in order not to weaken the acrylic resins further.

The rate of polymerization determines the rise in temperature. The faster the material hardens, the greater is the rise. The higher the temperature rises during polymerization within practical limits, the harder and stronger the restoration.

The two most desirable physical properties of the self-curing acrylic resins are their negligible insolubility in water and their initial esthetic appearance. They are not entirely stable in color, however; these restorations soon become yellow.

These resins exhibit poor adhesion to the dentinal walls. Better marginal seal is gained by the nonpressure technic than by the pressure technic.

An investigation of the effect of water/powder ratio on the accuracy of fit of gold alloy castings

K. H. Martin. *Australian D.J.* 1:202-203 Aug. 1956

In 1932 a report was published by the National Bureau of Standards in the United States, showing the effect of varying water:powder ratios on the fit of inlays. A small experiment was planned at the University of Queensland to test the importance of having a correct water:powder

ratio and to compare the thermal and the hygroscopic modes of compensation.

No significant difference was found in the thermal and hygroscopic methods of shrinkage compensation. A highly significant difference was found when the results of using 17.5 and 18 cc. of water were compared with the results of using 18.5 and 19 cc. of water. This difference indicates that the use of the correct water:powder ratio is of the utmost importance. The correct water:powder ratio was of greater consequence when the hygroscopic technic was used. The use of the correct water:powder ratio will lead to accurate castings. An error of 0.5 cc. or more in the water may result in misfitting castings.

Successful silicate restorations. Part 4

Ben Dent. *J. Missouri D.A.* 37:13-18 Jan. 1957

The silicate cements are probably the most abused and mishandled of all dental restorative materials. To produce a satisfactory silicate restoration, the dentist must know something of the physical properties, color matching, cavity preparation, mixing and finishing of the silicate cements.

Silicate cements have about the same coefficient of expansion as teeth (7.6 as against 7.8). All silicates are brittle. Although their compressive strength is more than adequate and they are at least as hard as dentin, silicate cements lack impact strength and cannot resist the forces of attrition and mastication. This brittleness confines their use to sheltered regions, such as gingival (Class V) and interproximal (Class III) cavities. Silicates can be used to rebuild an incisal angle only when reinforced with metal.

The lighting for color matching should approximate clear daylight. As a silicate hardens, it becomes more translucent, producing an apparent darkening of the material. Whenever the shade

guide tooth appears to be a fraction lighter than the tooth, the mix made with that shade will appear to match the tooth color 24 hours after insertion because the color of the dentin is carried into the translucent silicate.

As a patient ages, his teeth become darker whereas the color of the restorative material stays the same as when inserted. When the color of the silicate cement restoration no longer matches the color of the tooth, it should be replaced even though it is not washed out or leaking at the margins.

In cavity preparation the outline form should be smooth and regular with well-rounded angles. The cavity is cut boxlike with all margins at right angles to the external surface of the tooth. In Class III cavities sufficient entrance must be made to provide ample access for the removal of all carious matter, for preparation of the cavity and for insertion of the restorative material. Margins should be brought out into the interproximal embrasures far enough to allow for proper finishing. A silicate cement must be kept clean after insertion. Particular care should be exercised to eliminate all carious and decalcified dentin. Any decay left at the dentin/enamel junction will result in the "halo" observed about many silicate restorations.

For ease of preparation of silicate cements, the slab at room temperature is the best suited to the dentist's needs. The more powder incorporated into the liquid—within limits—the better the physical properties of the restoration. Although a silicate restoration can be finished and polished after 30 minutes, it is better to wait 24 hours, when the material is completely set; the restoration will last longer. Finishing is done with fine cuttlefish strips and slowly revolving disks and stones lubricated with petroleum jelly. A good polish can be secured by using silicate powder mixed with glycerin on medium felt wheels at low speed without pressure.

Doctoral and Masters' dissertations



In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

An evaluation of x-radiation during cephalometric and oral radiology. *James Carlyle Masters*. 1956. M.S. *University of Southern California*.

The effects of different quantity levels of protein on the cariogenicity of diet in rats. *Theodore Gustav Schoppe*. 1956. M.D.S. *University of Southern California*.

Experimental pulpotomy in the rat incisor. *John James O'Malley, Jr.* 1956. M.S. *University of Illinois*.

Growth in length of rabbit ribs at the costochondral junction. *Edward Wallace Roy*. 1956. M.S. *University of Illinois*.

Impression technique for a complete maxillary denture. *Keith Evans Thayer*. 1956. M.S. *State University of Iowa*.

Pulpless replantation procedures of canine teeth; a clinical and histological study. *Robert Morris Thompson*. 1956. M.S. *State University of Iowa*.

The effects of heredity upon craniofacial morphology as seen in cephalometric radiographs of twins. *Leon Arthur Montague*. 1956. M.S. *University of Michigan*.

The occurrence of certain dental anomalies in 1,049 complete mouth radiographs. *Herbert Dean Millard*. 1956. M.S. *University of Michigan*.

Damage to surgical rubber gloves through sterilization in autoclaves at various temperatures. (Zur Frage der Schädigung von Gummihandschuhen durch Sterilisation im Autoklaven bei verschiedenen Temperaturen). *Edith Möller*. 1954. DR. MED.DENT. *University of Frankfurt/Main, Germany*.

The self-curing plastic resin "Palavit F" utilized as filling material in conservative treatment (Der schnellhärtende Kunststoff "Palavit F" als Füllungsmaterial in der konservativen Zahnheilkunde). *Joachim Tetzlaff*. 1954. DR.MED.DENT. *University of Frankfurt/Main, Germany*.

Anatomy of the roots of lower bicuspid (Ein Beitrag zur Anatomie der Wurzelverhältnisse unterer Prämolaren). *Heinz Teucke*. 1954. DR.MED.DENT. *University of Frankfurt/Main, Germany*.

Inflammations of the maxillary sinus and their surgical treatment with Eckert-Möbius' method—a wide endonasal opening beginning at the lower nasal duct (Über die Entzündungen der Kieferhöhle und ihre Behandlung durch die endonasale breite Eröffnung vom unteren Nasengang aus nach Eckert-Möbius). *Jürgen Wendler*. 1954. DR. MED.DENT. *University of Frankfurt/Main, Germany*.

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Clinical and histologic diagnosis of pulpitis (Die klinische und histologische Diagnose der Pulpitis). *Herbert Wallmann*. 1954. DR.MED.DENT. *University of Göttingen, Germany*.

Pathogenesis and clinical treatment of carcinomas of the upper jaw: report of 37 cases treated at the Dental Clinic of the University of Greifswald (Zur Pathogenese, Klinik und Therapie der Oberkiefercarcinome unter Zugrundelegung von 37 Greifswalder Fällen). *Harald Gerndt*. 1954. DR.MED.DENT. *University of Greifswald, Germany*.

The musculature of the jaws and the dentate fascia in Greek tortoises (Über die Kiefermuskulatur und Mundfascien bei Testudo Graeca). *Gisela Hacker*. 1954. DR.MED.DENT. *University of Greifswald, Germany*.

Theories on the harmfulness of cement fillings in human teeth (Darstellung der Theorien über die Schädlichkeit der Zementfüllungen in menschlichen Zähnen). *Eleonore Kleefeld*. 1954. DR.MED.DENT. *University of Greifswald, Germany*.

Heterovaccination in treatment of actinomycosis and pseudoactinomycosis of the jaws (Beitrag zur Heterovaccination von Kieferaktinomykosen, besonders ihrer abortiven Formen—Pseudoaktinomykosen). *Götz Rau*. 1954. DR.MED.DENT. *University of Greifswald, Germany*.

Implantation of metal structures in edentulous jaws (Beitrag zur Frage der Implantation von Metallgerüsten bei zahnlosen Kiefern). *Bernd Dieter Tanneberg*. 1955. DR.MED.DENT. *University of Halle/Saale, Germany*.

Construction of partial dentures without clasps in oligodontia (Zur Frage der klammerlosen Prothese im teilweise bezahnten Gebiss). *Georg Busse*. 1954. DR.MED.DENT. *University of Halle/Saale, Germany*.

Investigation of the applicability of "Piacryl SH" for relining and repairing of dentures (Untersuchungen der Verwendungsmöglichkeiten von "Piacryl SH" bei Unterfütterungen und Reparaturen von Prothesen). *Walter Döppe*. 1954. DR.MED.DENT. *University of Halle/Saale, Germany*.

Surgical treatment of prognathism (Erfahrungen mit Progenieoperationen). *Ursula Döring*. 1954. DR.MED.DENT. *University of Halle/Saale, Germany*.

Accidents during local anesthesia: report of six cases (Beitrag zum Thema Narkosezwischenfälle einschliesslich Lokalanästhesie: behandelt an sechs einschlägigen Fällen). *Martina Eggert*. 1954. DR.MED.DENT. *University of Halle/Saale, Germany*.

Result of Axhausen's method in cleft lip surgery (Ergebnisse der Lippenspaltenoperationen nach Axhausen). *H. H. Boeckler*. 1954. DR.MED.DENT. *University of Halle/Saale, Germany*.

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Comparative studies of "Tiranal" and "Eucarsil" for indirect pulp capping (Vergleichende Untersuchungen der indirekten Überkappungsmittel "Tiranal" und "Eucarsil"). *H. J. Grösser*. 1954. DR.MED.DENT. *University of Marburg/Lahn, Germany*.

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Sugar and dental caries (Zucker und Zahnkaries). *Edwin Hellein*. 1953. DR.MED.DENT. *University of Mainz, Germany*.

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The toxicity of local anesthetics in intraoral, submucosal injections in rabbits (Die Toxizität lokalanaesthetischer Mittel bei der intraoralen submucösen Injektion am Kaninchen). *Heinz Herde*. 1953. DR.MED.DENT. *University of Mainz, Germany*.

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